The Builder.

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Stable Buildings and Coachman's House, Cavenham.—Mr. A. N. Prentice, A.R.I.B.A., Architect ..... *Single-Page Photo-Litho.*
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The Technical Instruction and Secondary Education Bill.

THE readers of this journal well know that long before the present interest in Technical Education arose we advocated a more systematic teaching of the subject. The present interest arises largely from fear. Englishmen have been told that foreign competition is now more formidable because the youth of this country is not properly equipped by technical education to compete with Germans and Americans. The people are therefore preparing to pay for the education, but somewhat less willingly than they do for guns and soldiers. This is one of the first points which must strike any one who considers the Government Bill on the subject of technical and secondary education. The Education Authority is to be allowed to levy a rate of twopence in the pound; if that is insufficient for a satisfactory system of technical and secondary education, so much the worse for education. The School Board has an unlimited power of rating for the purposes of elementary education, and the rate varies in most places from sixpence to ninepence. It is, therefore, perfectly obvious that the limitation in the Bill is inserted by the Government because the English people are prepared only to pay a limited sum for this purpose of secondary and technical education. This limitation is a very distinct blot on the new Bill; it will be a hindrance to satisfactory work, and it will be a drag on education. But we fear that it will remain in the Bill. By its means the Government hope to have a better chance of passing it into law. To those who object to the payment of rates, and prefer ignorance to education at a considerable cost, the Government will say, "See how cheap it is; it will cost you next to nothing." This is the way we legislate in this country.

We now come to the question of the educational authority. It has been pointed out many times in these columns that the County Councils were becoming more and more the most useful and the most dominant bodies in the country. Many of them show a breadth of view and an administrative grasp which is quite admirable. Many of them have employed the Technical Instruction Acts to very good purpose. It is, therefore, most satisfactory that the County Councils, with co-opted assistance, should be the new Educational Authority. It has been well said that the Bill, if it become law, will give local option in this respect to secondary and technical education. We do not feel much fear on this point. There is a good deal of competition between counties and County Councils, and on the whole the County Councils may be relied on to have a fair system. The members of these bodies are men, as a rule, above the average in education and intelligence. They are the pick of the country. They show signs of progress in the work of administering the highways and other matters. There is no reason to suppose they will be behindhand in regard to technical and secondary education. But there is the fatal financial limitation. There can be no doubt that however desirable technical education may be, a sound secondary education is equally, if not more, necessary. But this implies large schools, and numerous, capable, and well-paid teachers—such schools being placed systematically in the several counties. By this means the more capable scholars in the elementary schools would move automatically upwards, and from these secondary schools the scholars would turn into the practical business of the country. The great railways, the great building-houses, would know where to look for a supply of well-educated employés. But money must be found for the purpose.

Another point in the Bill which requires careful consideration is the position of the existing secondary schools. It does not seem that the educational authority will have an influence upon the grammar schools of the country, many of which are purely secondary schools. These schools will have a very anomalous existence. They will neither be part of what we call in this country—much to the bewilderment of Americans and Colonials—the public school system, nor of the county secondary education system. Many of these schools give a feeble classical education, whereas they should—while not dispensing with classical education—give also an education more technical and more modern. It would certainly be desirable that the smaller grammar schools, at any rate, should fall under the management of the County Councils. They would gain new life, and be a valuable adjunct towards a more complete and national system of technical and secondary education.

We have said nothing about what is now known as the Cockerton judgment, by which it was decided that it was illegal for Board Schools to give free education in technical and secondary education to schools without a fee. This point is dealt with in the Bill by allowing such teaching to be continued subject to the approval of the new Educational Authority. This is regarded as a temporary expedient. It may, however, become permanent. For it would be very convenient in many places if the secondary education could be brought close to the primary education. This point is likely to receive practical development. We have constantly pointed out that a sound system of primary education is the basis of all technical education, if the latter is to be worth anything. The Bill does not touch this question—oddly, and unfortunately, there is still mixed with elementary education the religious bogey, largely used by the clergy, because they wish to keep some personal authority over the voluntary schools. Once, however, the County Educational Authority gets to work, we believe that in those places where there is not now a strong elected educational body there will be a desire on the part of the people to see elementary education placed in the hands of the County and Borough Educational Authority. We can imagine nothing more absurd, nothing more likely to

offend English common sense, than that in some town there should be a Town Council managing a system of technical and secondary education while the primary education is in the hands of a vicar, churchwardens, and a few voluntary subscribers, who are at their wits' end how to make both ends meet. There will be many such instances, and they must cause public opinion to desire that the new authorities should have the power, sooner or later, of becoming the sole educational authority. It would be a great service to elementary education, and so to technical education, if many of the wretched little School Boards and small voluntary managing bodies could be absorbed by the County or Borough Council. But the main points which, finally, we desire again to emphasise are that this Bill creates an authority all over England for technical and secondary education; that it has the power of levying a rate for this purpose, to which will be added certain monies now used for technical education; that it rests with each locality, be it county or County Borough, to create a systematic series of schools for technical and secondary education. There are minor points which might be discussed, such as the amount of control to be exercised by the Board of Education; but it appears to be desirable to present to our readers the broader aspects of this most important change.

FRENCH ART IN 1901.—I.

THE Old Salon is on the whole a better exhibition than for three or four years past. It suffers, of course, both in the actual quality of its contents and in its effect on the visitor, by the immense extent of wall space and the immense number of works that are hung. The range of galleries appears, as far as one can compare by recollection, even larger than that in the old Palais de l'Industrie; the natural consequence is that many pictures have to be accepted merely to fill the walls, which in a smaller exhibition would be excluded as below the mark, and that the eye is almost bewildered and fatigued in the effort to pick out the fine things from such an immense mass of paintings. On the whole it may be said that the proportion of good to bad or uninteresting works is higher at the Royal Academy than at the Salon, but the actual numbers at the latter exhibition are so much greater (2,092 oil paintings against 923 at the Academy) that a larger number of fine works could be culled from among them, including some few, certainly, which are superior in power and interest to anything in our London exhibition. Also, of course, we find some of those monstrous and repellant vulgarities or cruelties on a large scale which French art alone seems to produce, and French taste alone to tolerate. M. Lalire contributes his usual huge hash of contorted nakednesses; M. Surand paints, on a very large scale, the pleasant subject of Caligula feeding his lions and tigers on living criminals; M. Danger represents Pestilence ("Fléau") by a naked giant, the height of the houses, walking down a street like Gulliver among the Lilliputians, and knocking the inhabitants over with a club; and M. Chocarne-Moreau, in "La Main Chaude," perpetrates a piece of sheer vulgarity which is honoured with a place in the great gallery. It is satisfactory to feel that such examples of brutality, absurdity, and vulgarity in art would at all events not find a place in any English exhibition.

In the aforesaid large gallery, to which the main staircase leads up, are of course collected those enormous canvasses which are a special characteristic of the Salon. Prominent among them is M. Béroud's "Paradis Perdu," in which a colossal Adam and Eve, respectively brown and white, descend a rocky slope from the gate of Eden; a very theatrical work, and yet not without a certain power which grows upon you. M. Bonnat has a large ceiling painting, an allegorical representation of "Justice," intended for the first Chamber of the Cour d'Appel at Paris; it is painted in a curious method, with a criss-cross of brush strokes making it look like a huge pastel; it is totally unsuited for a ceiling, being far too heavy in colour, and when in position the seated figure of Justice will be horizontal instead of upright. A painting like that on a ceiling upsets all one's ideas of the wrong and right way up of things. Now, M. Marioton, in the opposite corner of the gallery, a confirmed ceiling-painter, knows what to do with a ceiling; his "Symphonie des Fleurs" is bright and aërial in colour, and the figures seem to float and not to stand. M. Ferrier's ceiling painting for the *foyer* of the theatre at Nîmes has also a fine quality of the same kind, and will look well in position, and there is a great charm in one or two of the figures. M. Chalon's "Phryne aux Fêtes de Vénus" is uninteresting, nor has Phryne that beauty which would be the best excuse for the picture. M. Thomas's "Les Bergers," a decorative classic landscape and figures for the Mairie of Tours, is an imitation of Puvis de Chavannes without his brightness and delicacy of tone. Mr. Smith-Lewis exhibits here too his usual immense farm painting with unkempt horses the size of life, redeemed from artistic nothingness by a certain boldness of brush work. What a contrast to all the more or less violent works is M. Benner's calm and idyllic sacred picture, "Retour de la Fontaine," the Virgin with the infant Jesus walking before her; there is a simple and pure beauty about the child which is delightful. Also may we note with sympathy M. H. Flandrin's "Jeanne d'Arc en prière," kneeling with a sympathetic circle of spectators around her; there is more character in the faces of the spectators than in that of the principal figure, but it is a fine work in feeling, painted for the church of Sèvres, and having something of the severe style proper to a church painting, which must to a certain extent be regarded from a decorative point of view.

All these, and others, are in the great entrance gallery. From out of the rest of the long range of galleries, what can one select as of special interest? A selection it must be, for after all said, there are more interesting or clever pictures than one could have space to name in this article. The popular sensation of the year is M. Rochegrosse's triptych of Solomon and the Queen of Sheba, an exceedingly clever work in a superficial way; that is, the interest consists in the painstaking and brilliant manner in which a profusion of Oriental details of dress, ornament, and architecture has been painted, and the originality of invention displayed. It is a moderately large painting framed between two small uprights; on the left the Queen of Sheba solitary on her own throne, on the right her introduction into his harem by the king (which it appears is one form of the legend), in the centre her reception in state by Solomon. There is admirable detail in this; the helmets of the cavalry guard, for instance, are delightful; but it perhaps hardly rises higher than what may be called a superior piece of bric-à-brac painting. The specially-designed symbolic frame is a curiosity in itself. Perhaps the two most important of the pictures in which figures are the prominent subject are M. Gervais' large painting of "A Fête in Honour of Bacchus and Ariadne," and M. Henri Martin's "Bucolique." The former is a large open-air scene with a crowd of Greek figures, some grouped around a term-figure of Bacchus with a fire on a small altar before it, others coming in procession along the cliffs, with flowers and musical instruments, the whole backed by blue sea and hills in clear light. The painter has thoroughly caught the spirit of Greek Paganism, and there is a great deal of fine drawing and fine colour in the work; but compared with some of his previous works the figures seem a little hard and artificial. M. Martin's picture, painted in his usual peculiar touch-upon-touch method, which makes the texture of his pictures different from those of any other painter (no one seems to have thought of imitating him yet), is as completely Christian as the other is completely Pagan. It is a scene in a sloping partially wooded glade, on the right of which, among the sheep, are some figures of rustics and their children, on the left approach two floating figures which seem as the guardian angels of the pastoral life. There is great deal of tender and pathetic feeling in the human figures, and the whole picture is equally pleasing in a decorative and in what one may call a moral sense; there is a certain holiness about it.

M. Bouguereau, alas! exhibits that foolish and weak piece of prettiness which has already been seen in London at Messrs. Tooth's Gallery, "Amour voltigeant sur les Eaux;" a sad piece of stuff for an eminent painter to put forth as his principal work of the year; a fancy destitute of point or meaning, and cold in colour; redeemed only by good drawing. He exhibits a good portrait also, but with the same characteristics of hard surface and cold colour. Among the other figure pictures of this class one may distinguish between the merely vulgar nudes, coarse in execution and devoid of sentiment of any kind; the innocent healthy nudes, prompted by an honest delight in the figure; and the paintings in which the nude figure is made the medium of expressing a poetic ideal. The first class may be dismissed from notice—there are plenty of them, twisted into various contortions. Of the second are M. Chantron's pretty, but senseless and rather hard painting, "Les Nymphes s'amusent," and M. Nicolas Laurens' curious fancy of symbolising the fall of the leaf by three nude figures seated or clinging to a tree, and ready to drop off from exhaustion. Possibly the artist would claim that this came under the head of poetry, but it is too odd and far-fetched an idea to appeal much to one in that sense. M. Sezille's "Madeleine" is one of the best painted nudes, prostrate at full length, and hung so as to incline towards

some one's large painting of Christ on the Cross; but this attempt at symbolism of position (for which the Hanging Committee are responsible) will not do; the painting is no more a Magdalen than anything else; any name would do for it. With M. Printemp's "Songe d'Automne" we are in a different region; this figure reclined in the forest on the dead leaves is a poem, and a fine one. M. Lenoir's "Eros" is worth notice for fine painting, and bright expression, also M. Zacharie's clever little picture "La Femme à l'Oiseau," a kneeling figure with her face foreshortened, and snapping her fingers at a bird fluttering about—a really pretty and original fancy, and admirable in colour. Pretty also, though much inferior to the last-named in an artistic sense, is M. Le Quesne's fancy of three nymphs decked with coins and little else, representing "La Monnaie Française." M. Henner has a small nude figure in a dark landscape, of his usual type of feeling and execution—called, oddly enough, in the earlier editions of the catalogue, "Portrait."

A fine decorative painting is exhibited by Mlle. Marie Carpentier (a pupil of M. Raphael Collin), under the title "Repos," a richly and broadly treated evening landscape with draped figures; a kind of work which one only sees in a French exhibition—no English artist seems to have the feeling for it; or is it perhaps supposed that neither the Academy nor the public in this country would appreciate such purely intellectual painting, and that therefore the effect would be thrown away? A decorative picture of another kind, and the value of which is more open to question, is M. Quost's curious work, "Panneau Decoratif," consisting of a very flat and artificial treatment of a flowering garden, making a kind of screen of what may truly be called "artificial flowers" in the foreground, while in the background are seen some grey silhouetted figures of girls in the ghost of ordinary costume. This is a State commission — we do not learn for what. It comes as near as is possible to making a picture into a mere pattern.

Among figure pictures which come nearer to life and humanity is the "L'Adieu" of M. Ridel, whose fine works in which figures of everyday life are treated in a poetic manner have been before mentioned in our columns. This consists of two ladies on a pier watching a retreating steamer, one supporting the other; the point of the work is the manner in which a realistic representation is subdued in treatment and colour so as to give a kind of imaginative glamour to it; this is not, however, quite equal to some of this painter's previous works of the same class. M. Maxence's "Le Livre aux Œillets Rouges," half-lengths of two women with a book, is a very original and clever piece of what may be called mediævalism in painting, worth attention for its originality. Then we have of course the "moral lesson" paintings of modern life, most prominently illustrated in M. Duvent's large triptytch "La Joie du Travail," of which the side scenes represent work on the recent great exhibition, and the centre an illuminated fête of the completed exhibition; highly instructive no doubt, but not very valuable from an artistic point of view. Of what may be called idyllic paintings, in which figures and landscape are combined and transfused with the same sentiment, pleasing examples are to be found in M. Lelong's "Un Soir" where two rustic lovers are seated in front of a landscape and village bathed in evening light; and, in a more pathetic key, M. Voisard's "Coucher de Soleil," where the composition is cut across obliquely by the line of a hillside on which sits a woman in a melancholy attitude watching the setting sun. War pictures are not as numerous as usual, nor mostly very good, but there is one small work (in Gallery 23) by M. Sergent, which should by no means be passed over: "Attendant Sa Reserve". Napoléon at Marengo, still with the look and figure of a young man, seated (according to a contemporary account) on a bank at the edge of the high road holding his horse by the bridle, and looking down the road by which the reserves were to come up; one of the best and most real contributions to the pictorial illustration of Napoléon's career.

There are a good many fine portraits, of which M. Benjamin-Constant's of the Pope may be said to be the most remarkable both in execution and in expression of shrewd and penetrating character. M. Roybet's head of a coarse-looking man wearing eyeglasses is not beautiful, but one of the most forcibly painted things in the Exhibition. Among the portraits of ladies are some exceedingly fine ones; two half-lengths by M. Lauth, superb in colour and dignity; M. Gervais' queenly full length in black velvet, looking back from a window at which she stands; M. Hébert's two small and very characteristically coloured and highly finished half-lengths, in black frames which form a calculated element in the effect; M. Guinier's portrait of a lady in eighteenth century costume and holding a long wand, a picture with a texture and execution rather like pastel; and M. J. J. Lefebvre's exceedingly fine "Yvonne," a seated portrait of great dignity and beauty, and showing a bold and singularly effective line in the arrangement of the costume.

(To be concluded in our next issue.)

NOTES.

The Late Mr. Arthur Cates.

THE death of Mr. Arthur Cates removes from the architectural world of London a long-familiar figure which will be held in kindly remembrance by many both of the older and younger members of the profession. Though essentially a surveyor rather than an architect, Mr. Cates took the greatest interest in the advancement of architectural education; it was largely owing to his initiative that the Institute examinations in architecture were started; and even those who differ as to the value of these must recognise the praiseworthy motives which prompted his continued zeal in support of them. As a surveyor Mr. Cates occupied an exceptional position, and the fact of his appointment to be chairman of the Tribunal of Appeal was a notable practical testimony to the confidence felt in his knowledge and integrity. Some further particulars as to Mr. Cates's professional career will be found in our obituary column.

Improvement of High Roads.

WE have received a circular from the "Roads Improvement Association," which was incorporated in 1898 with the object of obtaining better roads in the United Kingdom. The Association now intend to bring organised pressure to bear on Parliament to amend the existing system of administration. The points to which they specially draw attention are the amount of avoidable wear and tear of vehicles caused by the rough and uneven surfaces of the majority of roads; the increase in road traffic and the development of new methods of locomotion, and the necessity of wider and better roads both on this account and for purposes of national defence (for the movement of troops and the transport of stores). The machinery for widening existing roads is so expensive and so cumbersome that few Local Authorities can be induced to put it into operation. The conclusion of the Association is that "a general improvement can be most readily effected through a central department directly responsible to Parliament." We believe they are quite right, and that this movement should have every support from the public. What strikes one most in traversing the roads of different counties in England is the great difference between the efficiency and the maintenance of the high roads under different County Authorities. In one county we find evidence of care and attention bestowed on keeping the roads in good condition; in another county we find the roads going to pieces for want of proper maintenance. In some districts, too, high-roads which have been set out centuries ago at a width perhaps at that time adequate to the requirements, still retain the same width, now become totally insufficient. A reform is much needed, and the establishment of a central authority would probably be the best way to bring it about.

The South Metropolitan Gas Bill.

THE preamble of this Bill has been proved, but the transfer of the property south of the Thames, now belonging to the Gas Light and Coke Company, to the South Metropolitan Company, is not to be made until Parliament has granted the former Company power to raise further capital. Any money obtained by the sale of gas at a higher rate to Local Authorities is to be used by the Gas Light and Coke Company for the relief of the ordinary gas consumer. For three years in succession the Gas Light Company has unsuccessfully endeavoured to obtain permission from Parliament to raise more capital, and it is therefore uncertain when the transfer will be made. Meanwhile, the Gas Light Company has, we understand, decided to check its output of penny-in-the-slot meters, because the ordinary consumer is more profitable; this is a retrograde step which will naturally increase the unpopularity of this great company, and will be severely felt by the working classes.

Power Gas at 3d. per 1,000 cubic feet.

IN the face of strong opposition, the preamble of the Mond Gas Bill has been proved, a few unimportant conditions being attached. Under this Bill a company is to be formed which will supply Mond gas to Smethwick, Walsall, West Bromwich, Wolverhampton, and a number of neighbouring towns. The gas is to be used for purposes other than lighting, and the maximum price is to be 3d. per 1,000 cubic ft. to consumers using more than four million cubic feet per quarter, and 4d. per 1,000 cubic ft. to consumers using less than that quantity. The promoters hope to be able to supply the gas at half the charge mentioned as a maximum. The company is to have the right of refusing to supply any

consumer with less than one million cubic feet per quarter, but as the gas is used at the rate of one million cubic feet *per hour* at the works of Brunner, Mond, & Co., in Cheshire, it is not anticipated that any works would require less than this quantity per quarter. Mond gas burns with a non-luminous flame, and has a heating value of about one-fourth that of ordinary coal gas. It can be applied to all descriptions of gas engines, including those used for driving dynamos for electric lighting. The scheme is a bold one, and should it prove a financial success, which is somewhat doubtful, a demand will speedily be made for a supply of gas cheaper than coal gas in other large towns. In London, water gas, having half the heating power of coal gas, but double that of Mond gas, would probably be found the most suitable, especially as it can be used without difficulty, after purification, for incandescent gas lighting. The progress of the experiment will be watched with the keenest interest.*

The Question of Vibration.

LONDON ought to feel grateful for the memorandum from Lord Rayleigh's Committee on the vibration caused by the Central London Railway. A short time ago there was so great an outcry from those residing or having business premises along the line, as well as from others, that it seemed probable the extension of tubular railways might receive an untimely check. In the memorandum to which we refer it is stated that the Committee is satisfied of the fact that serious vibration was felt in many houses on the course of the Central London Railway. Self-recording instruments indicated that vibration arose from the large proportion of weight of locomotives not carried by springs, and also from want of rigidity in the metals. The investigations of the Committee are not yet concluded, and when the results of further experiments are known, a more definite opinion than is at present possible is promised as to the steps that should be taken to reduce vibration on the line in question, and as to the features that should be included in new lines of a similar character. Meanwhile, it is gratifying to hear that the Committee believes that, under proper conditions, vibration can be prevented. A new form of locomotive has already been ordered from America by the railway company, and endeavours are being made to improve the permanent way, the unsatisfactory condition of which has been the subject of comment for some time past. Our opinion is that locomotives at all are a mistake, and we venture to think that this view will be fully justified by facts at no distant date.

The Rating of Machinery.

THE recently published annual report of the Machinery Users' Association for the year ending March 31 last shows how difficult are the questions which are now constantly arising in regard to the rating of machinery. It is pointed out that at Nottingham certain machinery was rated not only on its full value, "but also on the value of certain patent rights." This is somewhat ambiguous, but we understand it to mean that this machinery, being protected by the Patent Law, was regarded as of more value than arose from its manufacturing use only. This case is likely to be heard of again in the High Court, and is obviously one of some importance. The value of combination among capitalists is also made clear when it is stated that this Association assists in appeals by manufacturers against new valuations by rating authorities. Combination is, in fact, the only way by which traders or private individuals can appeal against powerful bodies.

Storage Batteries.

MR. HIGHFIELD read a paper on "Storage Batteries Controlled by Boosters" to the Institution of Electrical Engineers last week. Although this was the concluding meeting of the session there was a large attendance, and the discussion of the paper was most spirited. Mr. Highfield suggests that electricians should utilise storage batteries much more largely than they do at present. When central stations are first started it is customary to have only a small battery of storage cells in reserve. As the load increases the engineer is tempted to work this battery beyond its capacity, and hence to ruin it. This is probably the reason why so many stations discard batteries altogether after they have been started a few years. Another reason is that the method of controlling the charge and discharge of the battery by means of regulator cells hitherto in vogue, has proved a failure in practice. Mr. Highfield's suggestion is that a dynamo with a compound-wound armature, which is called a "reversible booster," should be used to regulate the cells. His system is a most simple one, and a year's trial which he has given to it at the combined lighting and traction station at St. Helens, has proved most successful. He has obtained an efficiency of 84 per cent. with his combined battery and booster. This excellent result is probably due to the fact that the booster prevents the voltage of the batteries ever falling abnormally. Mr. Trotter mentioned that he had seen the booster controlling the battery on a very intermittent traction load, and that the load on the engine was approximately constant, the battery levelling the load by absorbing and giving out energy alternately. He also mentioned that the direction of the current in the battery could be told by the hissing sound it made when charging. This proves that the battery was working at a voltage greater than two, and therefore at its highest efficiency. Engineers who are trying to find some means of saving the fuel wasted in raising steam and keeping hot long ranges of pipes when there is only a small load on the engine would do well to study Mr. Highfield's paper.

New Inn, Wych-street.

IT is stated that the proprietary rights in New Inn will be purchased for 157,000*l.*, the site of the Inn being required for carrying out the London County Council's improvements on the north side of the Strand. It appears that the "Ancients" hold the property under a lease from the Middle Temple, which would not terminate until three hundred years hence, and that the sum we mention is to be vested in representatives of the "Ancients" and the Middle Temple as trustees in that behalf. Since the destruction of Strand Inn by the Protector Somerset, this Inn is the only law seminary that has remained in the possession of the Middle Temple Society. Some five hundred years ago the site of New Inn was that of a travellers' hostelry known as Our Lady's inn from its sign of the Virgin Mary. Of its history as a place of legal education the accounts are scanty; in King Edward IV.'s reign the guest inn was acquired at a rental of 6*l.* per annum by Sir John Fineux, Lord Chief Justice of the King's Bench, for some students of the law who were then lodging in St. George's Inn (reputedly the most ancient Inn of Chancery in London), by Seacole-lane, in the Little Old Bailey. To New Inn, whence Sir Thomas More when a student migrated to Lincoln's Inn, were subsequently removed the students from Strand, or Chester, Inn, which however must not be confused with the adjacent town-house or "inn" also known as Lichfield and Coventry's Inn, originally built by Walter Langton, Bishop of Chester, *temp.* Edward I.

Kew Parish Church.

WE understand that it is proposed to complete the enlargement of the parish church of St. Anne at Kew as a memorial to Queen Victoria, to add a vestry for the clergy and choir, and to renovate the west porch and portico. The original church was built of brick in 1714-15, upon a piece of ground given by Queen Anne; in 1837 it was enlarged by Sir Jeffrey Wyattville, at an expense of 4,500*l.* defrayed by King William IV. and with a grant of 200*l.* from the Incorporated Society. In July, 1884, it was re-opened, after an addition had been made at the east end, from Mr. H. Stock's plans and designs (see the illustrations in the *Builder* of December 31, 1887). The extension comprised an additional bay to the nave and aisles, a new chancel with a low circular concrete dome, carried by an octagon clearstory, and a central apse beyond, an organ chamber, and a south porch. The alterations, costing in all 5,167*l.*, and adding about 40 ft. to the length of the church, involved the re-erection, at the extreme east, of the Cambridge mausoleum with its terminal semidome. It is not commonly known that the burial of Gainsborough in the churchyard was due to his desire to be laid by the side of his friend J. Joshua Kirby, the architect and author of treatises upon perspective. E. M. Ward, R.A., restored and enrailed Gainsborough's tombstone in 1865, and placed a tablet to his memory in the church.

Hogarth's House, Chelsea.

THE Hogarth House Preservation Committee of which Mr. G. C. Haité is chairman, and which includes among its members Mr. Walter Crane, Mr. Austin Dobson, Mr. Cosmo Monkhouse, and other well-known names, is appealing for funds to purchase Hogarth's house, and preserve it as a Hogarth Memorial and Museum. About 1,500*l.* will be required for this purpose. This is a scheme that ought to be supported; the house is an interesting example of the domestic architecture of its period, and Hogarth was too remarkable an English artist for his place of abode to be allowed to be destroyed and forgotten. Contributions can be sent to the Hon. Secretary to the Committee, Mr. Walter H. Whitear, 4, Ravenscroft-road, Chiswick.

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* For further information regarding the Mond scheme see the *Builder*, February 9, 1901.

Home Arts and Industries.

THE annual exhibition of the Home Arts and Industries Association is now open at the Royal Albert Hall. The best work of the Association lies in developing local industries where they already exist, awakening the interest of workers in design, and showing them the best models and methods of work; where nothing of the kind exists, classes are started of a useful and instructive nature. We always wonder at these exhibitions that we see no carpentry exhibits. Good simple carpentry is an uncommon accomplishment; it is not showy, but it is very useful and is the high road to a right appreciation and perception of more beautiful things. The best woodwork exhibits are amongst the inlay work, especially that of Miss Mabel de Grey from Pimlico, whose very clever work is within the limits of the material and the bounds of good design. A very good chair and music cabinet come from Bolton-on-Swale. Of a great deal of wood carving there are some good panels from Altrincham; the majority is poor and useless. The fact is that carving is out of place on the ordinary furniture of a house, and in perfection is only found in conjunction with architecture. Interesting architecturally are the terra-cotta exhibits from Compton, most of them from the designs of Mrs. G. F. Watts; they consist this year chiefly of useful garden ornaments—flower-vases, urns, and decorative work of an allegorical nature. In the needlework and fabric section the strongest work is that from Haslemere by Mr. and Mrs. Godfrey Blount, appliqué work in rich coloured linens of their own weaving and design, essentially modern in character. The tapestry from Aldeburgh, Suffolk, is very beautiful both in colour and design, and is the work of crippled girls. Incidentally the Association finds employment of a worthy character for cripples, the blind, and disabled soldiers and sailors.

Art in Corporation Badges.

A CORRESPONDENT, an architect, writes to us to draw attention to the fact that the Mayors' chains and badges which are being presented to some of the newly created London Boroughs are being, as he puts it, "executed by limited liability companies;" that is, they are the production, not of artists, but of trading firms. That is the usual way in England, and it will probably be some time before we see anything better, except in rare instances. Our correspondent adds that he was looking at one of these when another person came up and remarked "There's a lot of gold in that; it must have cost 200*l*." That is the English standard of value in such matters—"a lot of gold." What kind of design is made out of the gold is of no consequence, so long as the bullion value reaches a respectable figure.

JOINT HOSPITAL, CHORLEY, LANCASHIRE.—The new isolation hospital at Heath Charnock, near Chorley, has just been opened. There are five buildings—the administrative, the working, the scarlet fever, the typhoid, and the diphtheria blocks. Each of the buildings of the hospital proper has a glass verandah. The working block contains the disinfector house, the laundry, the mortuary, stables, and the ambulance house. The buildings stand within an enclosed area of something over six acres. The architects are Messrs. Jolly & Buckley, of Chorley; the contractor, Mr. Robert Brownley, of Chorley, with Mr. L. Fairclough, of Adlington, as sub-contractor for the stonework; Messrs. J. Fairclough & Sons for the slating and plastering; and the executors of Mr. Heald for the plumbing, painting, and the glazing.

THE ARCHITECTURAL ASSOCIATION:

SPECIAL GENERAL MEETING.

A SPECIAL general meeting of this Association was held in the Meeting room of the Royal Institute of British Architects, No. 9, Conduit-street, W., on Friday last week, at 7 p.m., to consider the Committee's proposals to add to or amend the following by-laws:—

To add to By-law 27: "The Committee shall appoint four trustees, who shall be members of the Association, in whose names the investments belonging to the Association shall be invested on behalf of the Association. Any vacancy in the number of trustees shall be immediately filled by the Committee."

[The Committee of the Association recommended the names of the following gentlemen to act as trustees: The President (Mr. W. H. Seth-Smith), and Messrs. G. H. Fellowes Prynne, Arnold Mitchell, and G. B. Carvill.]

By-law 26: After "Treasurer" add "or Secretary."

By-law 27: After the words "shall be paid by the Treasurer" add "or Secretary."

By-law 33 to read: "The office of President, Vice-President, or Librarian shall not be held by any member for more than two consecutive sessions. The office of Treasurer and Hon. Secretaries shall not be held by any member for more than five sessions and four sessions respectively."

The President (Mr. Seth-Smith) occupied the chair, and moved the adoption of the committee's proposals. In reference to By-law 33, he said that the Committee considered it objectionable on principle that offices of great responsibility should be held very long, and that it was far better to get fresh officers periodically.

The proposals having been agreed to the special meeting terminated, and the ordinary meeting commenced.

The minutes having been read and confirmed, some nominations having been read, and some donations to the library announced,

The Chairman said he proposed with much pleasure the names of Mr. Ernest George and Mr. J. M. Brydon for election.

These gentlemen having been elected by acclamation,

The Chairman announced that the annual dinner would be held at the Criterion Restaurant on Friday, May 31. The Committee desired to make the dinner a thorough success this year with the special view of saying what could be said as to the new educational departure the Association was taking, viz., the establishment of a Day School. It was hoped, therefore, that there would be a good attendance at the dinner.

Messrs. Ralph Berrill, A. E. Chasemore, A. D. Jenkins, J. H. Cooper, and J. H. Shearer having been elected members of the Association,

Mr. R. S. Balfour, Hon. Secretary, announced that a visit would be paid to Chesterfield House, South Audley-street, on the 18th inst., by permission of Lord Burton.

Mr. Alfred Hands, F.R.Met.Soc., then read the following paper:—

The Protection of Buildings from Lightning.

The popular idea of lightning comprises little more than that it is something stored up in a thundercloud which is apt to leave it and travel to earth, doing damage to objects which obstruct its course; that it is attracted to and conducted by metals; and that when it reaches the earth it disperses or becomes lost, more especially if it gets to water. These ideas give a very incorrect view as to what the problem involved in protection from lightning really is. As a consequence, it is popularly supposed to be a very easy one. All that is thought to be necessary is to have a lightning-conductor raised sufficiently high to attract the lightning; it must be of large size to allow an easy path for the discharge, and its lower end must be taken into moist ground or into water, and there the matter ends. This view also contains an element of truth, but it is very far from being the solution of the problem. Instead of being a simple matter, protection from lightning is a most complex subject, and probably one of the most difficult among the many which architects are called upon to deal with in the course of the erection of buildings.

I cannot within the narrow limits of a paper place before you the whole subject, but I hope to be able to show something of the principles which are involved, and more especially as to the common-sense view, for, although it is very often ignored, there is such an aspect. I think that little could be said in favour of lightning conductors if they would not bear the searching light of common sense. It is not a subject which can be taken up lightly and disposed of in a few words, and a thorough knowledge can only be obtained by very close study, exhaustive experiments, a careful investigation of the phenomena exhibited by nature when objects are damaged by lightning, and a very extensive experience of the questions to be considered in the protection of buildings. It is a subject which, when one has studied superficially, one is apt to consider easy and that one has mastered, but that after studying in all its bearings for a few years one finds is very much more difficult than one thought, and requires long and close application before it can be thoroughly mastered. There are so many subjects which it is necessary for architects to be thoroughly conversant with that I think few could spare the time necessary to render themselves experts in this one. At the same time it is advisable that they should know something of the principles involved, for until they do, cases of so-called failure of lightning conductors, which are far more frequent than they should be, will continue to occur.

The subject is, I consider, a most important one, because, apart from human life being at stake, a vast amount of property is annually destroyed by thunderstorms—losses which could be prevented by a scientific application of conductors which would render their destructive effects nugatory. It is impossible to arrive at the amount of damage to property which occurs yearly in this country, but I believe I am below rather than above the actual figures in saying that it must be between 50,000*l*. and 100,000*l*. I have for many years been collecting particulars of damage of this nature, but I do not suppose that my record is anything like a complete one, because the list of papers searched has necessarily been limited, and besides there are very many cases which are not reported, even in the local Press—every year many unreported cases have been brought to my notice. From these particulars I am at present preparing a map of England showing the positions and nature of the objects struck. This work takes considerable time if one desires to be accurate, and I have at present only completed from the beginning of 1898 to the present time, but thinking it might be of interest to you I have prepared a copy. This map has spots of various colours representing buildings, ricks, trees, and other objects damaged or destroyed, and human beings and animals killed or injured. I particularly wish to draw attention to the fact that most of our large towns, and particularly the manufacturing ones, are indicated by the number of cases of damage; I think this ought to dispose of the mistaken idea sometimes expressed that the smoke in towns acts as a protection.

I do not propose going into the question of the origin or process of formation of thunderstorms, but in order to understand the principles involved in the science of protection, it is necessary clearly to understand the electrical action in a storm of this kind. You are aware, of course, that lightning is merely electricity differing in no respect from that generated by a frictional or influence electrical machine, except that it is on a gigantic scale. You are also doubtless aware that this form of electricity called static is of a dual nature generally called positive and negative; that it is impossible to produce one without the other, and that by a process called induction, where the one state is existent the other will be near it, being only prevented from joining by whatever insulating material is interposed. The existence of one electrical state is proof of the existence of the other, and that it is as near as the insulating material will allow it to get. This is precisely what occurs in a thunderstorm. The storm clouds provide the charge of one nature, and the earth with the buildings and other objects on it has by induction the other—the air between is the insulator which tends to prevent their joining. Of course, it frequently happens that different clouds in one storm are oppositely electrified, and hence we get flashes from one cloud to another, but as these discharges do not affect our safety, we may leave them out of account. Presuming that the cloud is positive, the earth and the objects on it are necessarily negative, and therefore there is a state of tension between the two which becomes more acute as the

respective charges increase, until at last the tension becomes too great, the insulating material gives way, and momentarily the path of the strain becomes visible by a line of matter rendered incandescent, and this we call lightning. The strain has existed before the flash appears, and the path it follows is all prearranged. One cannot say that anything has left the cloud to come to earth, any more than that something has left the earth to travel skywards. It is merely the re-uniting of the two states, or rather the restoring of the equilibrium which had before been disturbed.

Franklin at one time used the terms plus and minus in place of positive and negative, and they are in a way convenient; but it will be more correct, and, I think, more simple, if we treat the matter merely as a difference of potential, for one state is only negative or minus relatively to the other. Adopting the terms plus and minus for the moment, however, we may say that if we regard a mild so-called positive charge as + 1, the corresponding negative charge would be − 1; or a more powerful positive charge as + 1,000, the negative would be − 1,000. In either case the total of the two joined would be 0, or a state of quiescence, and the difference between the two values + 1 and − 1, and + 1,000 and − 1,000 respectively, would represent the difference of potential. But it is not necessary that difference of potential should be above and below zero, it may be all on one side, thus it may be compared to the difference between +1 and +2 or −1 and −2. Now, wherever a difference of potential exists there is a strain due to the necessity of restoring the equilibrium or level, and if the strain is great enough to break down the insulating material, a spark will pass. Therefore, if we could do away with the strain, or reduce it in time, we should prevent the breakdown, or in other words prevent the discharge taking place, and this is what we endeavour to do when we provide a lightning-conductor with points. They possess this power; they may almost be considered as safety-valves. While the potential in the clouds is being raised in the process of the formation of the storm, every point is reducing the strain by what is called brush or silent discharge. Theoretically, a lightning-conductor should never be struck by lightning; practically, it may be because the potential may be raised so rapidly that the points cannot reduce the strain quickly enough. Points, however, possess a very considerable protective effect and form a most important function of a lightning-conductor, although not absolute. The conductor might even be so far inefficient that it would not convey a lightning discharge harmlessly and yet the points would still exert their protective effect in this way. During a thunderstorm the points of a conductor may frequently be seen to glow with the light of the brush discharge, and this may even be concentrated into short sparks or a spitting effect, as Professor Lodge graphically put it. Then we hear people say they have seen the lightning playing about the lightning-conductors. When this occurs the tension must be enormous, and it is just a question whether the lightning flash will occur or not.

If the points are not able to prevent discharge, the second function of the lightning-conductor, its power of conduction, should prevent any harm occurring to the building on which it is fixed if it has been applied on scientific principles, but it is just in this that the complicated and difficult nature of the matter consists.

I think it will make the matter clearer if I digress to touch briefly on what may be called the principal epochs in the history of protection.

It has been claimed that the invention of the lightning conductor was complete in its first inception, like Minerva springing into being from Jupiter's head; but this is very far from being so. When, in 1752, Benjamin Franklin established the identity of electricity and lightning, he immediately suggested the possibility of preventing the damage which this force caused to buildings. Knowing the effect of a point in neutralising an electric charge, his original idea, I am inclined to believe, was that buildings should be provided with a metal point on the highest part and that this should have the effect of preventing their being even attacked by lightning. The necessity for having a continuous conductor of metal from the point to the ground became evident, but this also was found to be insufficient. Then he realised that it was necessary to have the conductor carried deep enough into the ground to be in connexion with conducting earth—that is to say, moist earth or water. So the idea of the lightning-conductor as regards its main principles was evolved. Buildings in Franklin's day were easy to protect; those of to-day are very different.

The next important epoch was when William Snow Harris became interested in the subject, more especially as regards the protection of ships from damage by lightning, the losses sustained from this cause both by the Royal Navy and the mercantile marine being at that time very considerable. Snow Harris succeeded in getting his system of protection adopted by the Admiralty, and became the premier authority of his day on this subject, ultimately receiving the honour of knighthood for the services he had rendered. Many of our important public buildings were protected in accordance with the plans and specifications of this distinguished scientist, and no case of failure occurred to show that he had blundered. I have had the opportunity of examining some of the buildings fitted in accordance with the plans of Sir William Snow Harris, and have been particularly struck with the thoroughness with which they had evidently been studied. One could clearly see the master mind in the way in which the work had been done. Snow Harris advocated copper as being the best conducting and most durable metal, and therefore the most suitable for lightning conductors. His system, which generally comprised a number of conductors on one building, was to connect all the metals about the structure to one another and to the conductor system so as to bring the whole mass into a state of uninterrupted conduction. A most interesting controversy took place between Mr. C. V. Walker, F.R.S., who was at one time President of the Meteorological Society, and Sir William Snow Harris on the question of side-flash or lateral discharge. Walker contended that sparks might pass between a lightning conductor and other metals about the building adjacent to it. Snow Harris made a distinction between metals which were earth-connected and would therefore form alternative paths for the discharge, and insulated metals which would not assist its passage to earth. He argued that while there would be a division of the discharge between the conductor and the alternative path, sparking to the insulated metals was impossible. One wonders in reading his works whether he really believed that sparks would only occur to metals leading to earth. The elaborate precautions that were taken to connect his conductors with all the metals about the building, whether going to earth or not, do not bear out this contention, or where would have been the necessity for such connexions? The only construction I can put upon the matter is that he meant that with his system of protection side flash was impossible. I acknowledge that this argument savours of special pleading for Snow Harris, for his writings seem to indicate that his words are to be taken literally. In his work on "Thunderstorms" he discusses the matter at some length and illustrates his arguments by two diagrams. In No. 1 he shows the alternative paths in which case he declares side flash would occur, owing to dividing of the discharge between the different paths afforded. In No. 2 he shows near his conductor insulated metals to which he says side flash will not occur. At least that is I presume what he intends his readers to understand but his words are rather ambiguous. He says, "Can the bodies *a*, *b*, *c*, elicit from the conductor at the instant of its transmitting a heavy discharge of lightning, a destructive lateral explosion upon the parts of the building on which they happen to be placed? This is the legitimate and fair definition of lateral discharge as applicable to a lightning rod." I have no hesitation in saying that if that conductor was struck by a heavy discharge of lightning, as he calls it, sparks would pass, though they would be merely sparks between the conductor and those metals, not "explosions" in the bricks to which they are fixed, and there would probably be no traces afterwards of their passage; but if we altered the conditions slightly by placing the conductor about 3 in. from the corner of a building, and the metals 3 in. round the corner, the bricks between would be slightly damaged.

The next event to which I have to draw your attention is the formation of the Lightning Rod Conference. In 1878 the Royal Meteorological Society decided that it was expedient that a conference should be held to consider the best means of protection from lightning, and issued invitations to certain other learned societies to appoint delegates. As a result the following gentlemen were appointed:—Mr. C. Brooke, F.R.S. (who unfortunately died the following year), Mr. E. E. Dymond and Mr. G. J. Symons, F.R.S., representing the Meteorological Society; Professor Lewis and Mr. J. Whichcord representing the Royal Institute of British Architects; Mr. Latimer Clark and Mr. (now Sir) Wm. H. Preece, F.R.S., representing the Society of Telegraph Engineers and Electricians, as the Institute of Electrical Engineers was then called; and Professor W. Grylls Adams, F.R.S., and Professor G. Carey Foster, F.R.S., representing the Physical Society. Professor W. E. Ayrton, F.R.S., and Professor D. E. Hughes, F.R.S., were afterwards added as co-opted members. We have here a brilliant array of names, and it is difficult to believe that a better selection could have been made for the purpose. Their labours extended to December, 1881, when their Report was issued. During that time they had exhaustively examined all the evidence they could collect as regards damage by lightning, the methods adopted by manufacturers, and the writings of British and foreign authors.

The Report of the Lightning Rod Conference, as it is called, was published by Spons in 1882, and became the standard work of reference on the subject in the English language. Personally, I consider the rules they drew up, although not faultless, are admirable in the way in which I believe they were intended—that is, as a guide to architects and others interested in buildings, which should enable them to learn something of the methods employed in the protection of such structures, and give them some such knowledge as should enable them to see that the work was being carried out on scientific principles; to do away with prejudices often entertained against the use of conductors; but most of all to try and dispel the extraordinary ignorance displayed at that time by some of those engaged in the erection of conductors.

I cannot believe that the Report was ever intended to serve as a complete guide capable of rendering any one who read it an expert fully qualified to plan the lightning conductor system necessary for the protection of a building. If it was, it was a dismal failure, and I do not believe that it is within the power of any man, or of any body of men, no matter what their scientific attainments, to formulate a set of rules which shall serve such a purpose. This Report contains most of the facts which one requires to know, provided one understands the subject sufficiently well to be able to read between the lines and judge the lines of thought which no doubt induced the delegates to frame the rules. For instance, nothing is said about sparking, or side flash, from the conductor in actual words, but they draw attention to the necessity of connecting all masses of metal about the building with the conductor. As in our criticism of Snow Harris, we can say, if sparking, or side flash, was not admitted, where would be the object of advising these connexions? This rule commences:—"As far as practical, it is desirable that the conductor be connected to extensive masses of metal, such as hot-water pipes, &c., both internal and external." I consider the wording of this rule most unfortunate, because practicability has nothing to do with the matter. The connexions are either necessary or they are not. If they are necessary, practicability must not be taken into account; means must be taken to connect them even if it is inconvenient. This rule has led to the assumption that these connexions are not of vital importance, and therefore they are not generally made. With internal metals, for instance, it is rarely considered practical to connect them, because people naturally object to have their walls cut about in order to have a connexion carried through. The explanation of the anomaly is, to my mind, to be found in the words which follow:—"But it should be kept away from all soft metal pipes, and from internal gas pipes of every kind." Obviously, if connecting to internal metals is not practical, the alternative is to keep the conductor sufficiently far away, but the point is generally missed. Probably the vagueness of the first part has led architects and others to think that the whole rule is unimportant, for in the course of a rather wide experience I have never yet met an architect who took into con-

sideration the positions of inside gas or water pipes or other metals when deciding where he would have his conductors fixed.

The conference clearly stated that lightning conductors may be of iron or copper, but advocated the latter metal as being more convenient and durable, and in the end the cheapest. They stated that the minimum size to be used should be a weight of 6 oz. to the foot run, which in copper tape, the form now mostly used, would be ⅝ in. wide by ⅛ in. thick.

The last epoch that we have to consider brings us to more recent times. In 1888, Dr. Oliver Lodge, F.R.S., was invited by the Society of Arts to deliver two lectures on "Lightning Conductors" in memory of the late Dr. Mann, at one time a President of the Royal Meteorological Society, and who, during his lifetime, had taken a keen interest in the subject of protection from lightning. Professor Lodge is one of our most brilliant scientists, but I do not know that he had paid particular attention to this subject previous to this invitation. Professor Lodge delivered these lectures, and I am speaking mildly in saying that they created a sensation. In the course of these he carried out experiments intended to show that a very thin iron conductor was better for the purpose of a lightning conductor than a thick copper one. Incidentally he showed that small-size iron wire was better than stout iron, and that small size copper was better than stout copper. Here we have what appears to be a paradox—the worse the conductor the better it is. It is necessary to say that Professor Lodge states that "the values given are a record of a definite experiment, but their precise value depends on the circumstance of the experiment. It is easy to arrange so that the iron is less effective than the copper." Nevertheless, he remarked that he looked upon copper conductors as doomed. No discussion being allowed at these lectures, criticism of Dr. Lodge's views was impossible, but it was an open secret that he was strongly opposed by other scientists, of whom Sir William Preece was, perhaps, the most antagonistic. At the British Association meeting at Bath in the July following the matter was discussed, and the battle between what were called the schools of theory and experience was fiercely waged. Neither side could claim a definite victory, and so Professor Lodge was asked to read a paper before the Institute of Electrical Engineers, at which the audience being electricians, it was thought that the arguments on both sides would be better understood. So in 1889 a most interesting paper was read, at which most of the leaders of the electrical world were present. In this paper Dr. Lodge discussed at great length the question of side flash, or sparking, from a conductor, but he did not draw a line, as Snow Harris had done, between sparking to insulated metals, and the dividing of a discharge between a conductor and an alternative path. On the contrary, he appeared rather to treat all side flashes as being portions of the discharge, leaving the conductor to go to earth by other and sometimes worse routes, with the exception of secondary effects or the sparkings caused by induction in metals not connected with the conductor. He contended that the older electricians, as he termed what may be called the votaries of experience, had not taken certain laws and effects into consideration. One of the main points in his arguments was that a lightning flash is not a single discharge, but is oscillatory; that is to say, that it consists of a number of discharges backwards and forwards till it comes to rest, a dozen or more alternations probably occurring in a flash occupying a minute fraction of a second, and that under these circumstances the generally accepted ideas as to the comparative conducting value of copper and iron are changed. Therefore, he now contended, iron of the same thickness as copper was "a trifle better, certainly not a whit worse than the latter metal." I may say here that in the discussion which followed, and which was so lengthy that, including the reading of the paper, it extended over three meetings, Dr. Lodge was opposed by the majority of the speakers. They did not, however, protest against the possibility of side flash, but the ground mainly taken up was that lightning was not oscillatory, and they contended that the older views as to conductivity were sound. It is abundantly proved that the spark from a Leyden jar or any perfect conductor is oscillatory, but Dr. Lodge has himself pointed out that a cloud is not a perfect conductor like the coating of a jar or the sheet of metal generally used to represent a cloud in laboratory experiments; that it has an enormous resistance owing to its being composed of globules of water separated by air, and therefore theoretically I should say that lightning should not be oscillatory because the resistance would damp out the oscillations. The question is, however, I consider an unimportant one, because if harm was not caused by the first or second swing, the remainder would be harmless. Whether oscillatory or not, lightning has not suddenly changed its character, and without intending to detract in the slightest from the value of either theory or laboratory experiments. I must point out that the greatest value attaches to the observed effects of lightning.

Dr. Lodge illustrated his lectures and paper by some most interesting experiments, which, however, I consider were not conclusive, because the conditions were not such as occur in Nature. It would take too much time to discuss these experiments, but I may point out that the governing principle was to have a conductor of enormous length compared to the length of the spark used to represent the lightning flash. By doing this, the effect, for instance, with side flash is to exaggerate the sparking out of all proportion, and hence those who did not absolutely disagree with Dr. Lodge appeared to me to get an impression that if his experiments were to be relied upon, lightning conductors would be almost useless, for side flash would occur to metals an enormous distance away. For this reason I have not introduced any experiments this evening, because if I magnified the effects in the same way, similar confusion might be caused in your minds, and if carried out in my own way—that is to say, by making everything more nearly proportional, and so approximating as far as possible to what occurs in Nature—the results would be invisible except to a very few. To this day I often hear it said that Dr. Lodge says lightning conductors are useless, and therefore I may quote his disclaimer. In his book on "Lightning Conductors," published by Whittaker's, he says: "I may be permitted here to repudiate the doctrine which has several times been attributed to me since the Bath meeting, that it is safest to be without lightning conductors altogether. The long experience of persons learned in this art is by no means to be despised, and until an agreement as to improvements has been arrived at, the safest plan for ordinary persons is to adhere to existing practice."

Dr. Lodge's work forms, in my opinion, an important addition to the literature of the subject, if taken as purely of theoretical value, and on which we must base our own ideas of the practical results which are to follow. He has called attention to the necessity for taking certain effects more fully into consideration when arranging our system of defence, and has shown us some of the scientific reasons for their appearance, and for this we owe him a debt of gratitude such as we owe to every man who labours to give us a clearer insight into the mysteries of Nature.

The effect so far of his work, however, appears to me to have been to cause a great deal of confusion in the minds of some people, and I must protest against the exaggerated views that are often expressed in relation to these effects. For instance, Dr. Lodge has referred to side flash and to the surging effect of a discharge, and other writers have referred to these effects as if they were some new invention of the devil tacked on to lightning to render it still more deadly than of old. These effects have existed since the days when lightning conductors were first invented, and even before then to the earliest times in which metals used in the construction of buildings have acted as accidental or partial conductors of the electricity from thunderstorms.

Dr. Lodge has made suggestions as to improvements which he considered might be made in the application of lightning conductors. He prefaced these by saying, "It is a matter on which I have not the slightest wish to be dogmatic; and if I make a few apparently definite assertions, it is only by way of expressing such judgment as I have been able to form at present, and they are to be taken as intended, more by way of suggestion and question than anything else." Leaving out of account those rules which apply only to powder magazines and lightning arresters, and three which refer to testing and which are not of practical value, there are only ten which differ materially from previous scientific knowledge of the subject. I will give these ten rules together with a few remarks, though my later observations will deal more fully with the matter:—

1. The use of copper for lightning conductors is a needless extravagance.

2. Iron has advantages over every other metal.

My later remarks will deal with the question of copper *v.* iron.

3. It is hopeless to pretend to make the lightning conductor so much the easiest path that all others are protected. All possible paths will share the discharge between them, and a lot of apparently impossible ones.

This rule does not differ, except as regards the "apparently impossible ones," from the dividing of a discharge among alternative paths Snow Harris explained about fifty years before. My later remarks may explain this more fully.

4. At all places where water and gas-pipes come near each other, and in general where one metal ramification approaches another, it is best to connect them metallically.

This rule Dr. Lodge has since admitted is very open to criticism, but I consider that it would be an admirable one if it was only qualified by being made to read that in some cases it may be absolutely necessary to make such connexions.

5. It is not wise to erect very tall pointed rods above the roof of a building.

6. In ordinary houses it may be well to try and insulate the lightning conductor from the walls, so as to lessen the chance of side flash to metal stoves and things inside.

7. In chimneys, it may be well to use insulators to protect the bricks from concussion.

These three rules Dr. Lodge has since described as very doubtful.

8. The orthodox rule "connect all pieces of metal to the lightning conductor" requires modification thus, "connect all pieces of metal to each other and to the earth, but not to the lightning conductor."

9. It may be always reckoned safe to earth things independently. It is often not safe to connect them to the lightning conductor; *e.g.*, an inside lining of a chimney should be well earthed, but should not be used as lightning conductor, nor connected with it. The same with rain-water pipes and gutters. The same also probably with lead roofs.

After each of these two rules Dr. Lodge placed a note of interrogation to show, I presume, that he was doubtful about them, and he has since admitted the force of the criticism to which they were subjected, and says he gladly takes refuge in another rule which contains the truism that the most difficult thing is to know what to connect and what to avoid. These two rules would be of vital importance, and would revolutionise present practice if they could be justified, but I hope to show you that they would be dangerous in the extreme, and far from tending to increased efficiency of conductors, would cause failure. They have, however, been quoted by others as if they were correct, and without Dr. Lodge's subsequent remarks, or even the notes of interrogation after them.

10. Over the top of tall chimneys it is well to take a loop or arch of the lightning conductor made of any stout and durable metal. Dr. Lodge has since modified this rule, but I need only say that the coronal band with points at intervals, recommended by the Lightning Rod Conference, answers the purpose perfectly.

Although Dr. Lodge's views did not, I think, obtain the consideration they deserved, we may still consider that there are in existence the two schools, the one of theory pure and simple, as represented by Dr. Lodge, and the school of experience, as represented by the teachings of the older electricians, as Dr. Lodge called them. Between these two we must discriminate and formulate the method of procedure which will ensure success. Theory and experience are each in their way of the greatest value, but one is useless without the other. Experience without theory is not sufficient. A man might have a lifelong experience of the protection of buildings, but if his methods were not guided by theoretical knowledge, that is, if he did not know why he did certain things, success would be at the best uncertain. On the other hand, a man might have a perfect theoretical knowledge and yet be completely lost when he attempted to put his theories to practical application. It must not be supposed that I refer to the members of the Lightning Rod

Conference as men of experience without theory. On the contrary, if they had not adopted or accepted through their chief speaker, Sir William Preece, the title of the school of experience, I should have styled them a school of theory also, for the Conference consisted of men of science pure and simple, who had probably had very little practical experience of the protection of buildings. Their claim to have founded the rules on experience is probably based mainly on the fact that the evidence they collected and considered was largely of a practical kind. For the sake of distinction, however, we will keep to the terms theory and experience in considering the points in dispute. Experience says, let your conductors be of copper, which is of better conducting capacity than iron or any other metal which it would be practical to use for the purpose; and besides, it is the most durable, and in the end the cheapest. The comparative conductivity of copper and iron, they base on tests made by many distinguished scientists, both British and foreign, who have shown that in the case of steady currents of electricity copper conducts about seven times as well as iron. Theory says, that for sudden discharges such as lightning the conditions are changed and that iron is "a trifle better, certainly not a whit worse than copper," and that the use of the latter metal is a needless extravagance. Also that instead of having single conductors of copper, a number of lines of conduction of iron wire of small size is better (ordinary telegraph wire is suggested); that these wires should be carried down each corner of every chimney stack and on all sides of the building. For a chimney shaft this system is to consist of galvanised iron wires fixed vertically on all sides with other wires carried round the shaft at intervals to connect them all together. On purely theoretical grounds, I see little to choose between the two systems provided the conductors are applied on scientific principles. A man who understood the subject thoroughly would be able to protect a building as perfectly with one system as with the other, but the many iron wires would be more difficult to apply successfully, because it is easier to place one or two conductors so as not to be within sparking distance of metals to which it is not advisable to connect them than to fix a dozen so. We have had a very extended knowledge of the experience type of conductor, and we have had plenty of cases in which they have succeeded. We have also had cases in which they have failed. I have myself inspected a great number, that is to say, nearly every case I have heard of. The number has been on an average about a dozen a year, but in every case that I have examined, with one exception, there have been glaring defects such as rendered the failure certain, and which could have been pointed out beforehand by a competent person who had examined the building before the accident happened. The one exception was Neadwood Church, Staffordshire, where sparking occurred owing to a line of metal having been laid from close to the conductor to near a large metal stove used for heating the building. The line of metal was the lead binding of some matting—insignificant enough in itself, but from an electrical point of view it brought the stove into dangerous proximity with the conductor. Of the theory type of conductor we have had very little opportunity of judging. In one case, in which it has had to bear the test of being struck by lightning, it failed. This was the Hotel de Ville at Brussels, and this was set on fire, curiously enough, about the time that the great Preece *v.* Lodge controversy was proceeding. I have only had an opportunity of examining one system of this sort erected in this country. So far as I know, it has never been subjected to the test of lightning, but it is, nevertheless, an instructive case. In 1894-95 a chimney-shaft was being built for the Islington Electric Light Station, and the chief engineer, Mr. Albert Gay, having followed Dr. Lodge's arguments very closely, decided to try the small iron wire system of conductors. By 1897, however, it was found that this system had perished to such an extent, that, in order to avoid the expense of frequent renewals, it was decided to provide also for the same shaft an ordinary conductor of copper tape, 1½ in. by ½ in. The cost of the copper conductor was 22*l*. I have not ascertained the amount paid for the iron wire system; but, allowing for the same rate of profit that appears to have been made on the copper ore, I estimate that the cost must have been between 35*l*. and 38*l*. A few days since I had an opportunity of examining the two systems, and found that, while the iron one had largely perished at the top where it was exposed to the fumes of the chimney, the copper one was practically as good as when it was fixed. This would, I think, be a fair sample of the theory type of conductor—durability sacrificed and original cost increased tremendously. For it is a very great mistake for Dr. Lodge to suppose that his suggested iron telegraph wire system would be cheaper than the copper tape generally used. Iron is, of course, cheaper than copper, but the cost of fixing is a serious item, and where say several hundred feet of iron wire has to be fixed in place of a hundred feet of copper tape, the total cost must be greatly increased if the work is to be done by competent men under the guidance of an expert. If Dr. Lodge had any idea that a local blacksmith or labourer could be entrusted with the work and the expert and his trained workmen done away with, the result would, I believe, still be increased cost, and instead of hearing of occasional cases where conductors had failed, we should be astounded to hear occasionally that a conductor had actually been successful.

Personally I do not attach very great importance to the kind of metal to be used for a lightning conductor. The conductor may be of copper or iron, or it might even be of lead, so long as it is of sufficient capacity not to be melted by the heating effect of a severe discharge, it will answer if properly applied. It must not be supposed from this that I advocate the use of lead, or even iron. Iron conductors have been used almost exclusively in America since Franklin's day and also in some Continental countries with as good results as in England where copper is almost exclusively used. It is very probable that the older ideas as to the relative conductivities of copper and iron do not apply in the case of sudden discharges, although I do not think that Dr. Lodge has proved his case; but if iron, instead of being "not a whit worse than copper," was seven times as good, it would not prevent the dividing of the discharge between it and other paths afforded, or even sparking to insulated metals, if it was not scientifically applied; and on the score of durability and cheapness, I have no hesitation in saying that the older type, or copper tape conductor, cannot be beaten. On the score of appearance, too, copper tape has the advantage, and appearance has to be considered, for I do not think there are many architects who would consent to have their work turned into what would look like enormous birdcages.

As Dr. Lodge has himself said, it is impossible to make the lightning conductor such a superlatively easy path that the discharge will take that one only if other paths are open for it, but it is here that the skill and scientific knowledge of the expert has to be shown. If one had to protect a structure composed only of brick, stone, or wood, and with not a particle of metal in its construction, nothing would be easier. All that would be necessary would be to have a conductor of metal, pointed at the top and leading down into the earth. It might be made in lengths scarcely touching one another, and the earth connexion might be absolutely bad, and yet the building would be protected. All that would happen would be heating and possible fusion at the joints, and the ground at the foot of the conductor might be blown up. It is very rarely, however, that one is called upon to protect a structure of that kind. Modern buildings are often a mass of what I may call unintentional lightning conductors, for all the metals used in the construction of buildings are conductors of electricity, and therefore conductors of lightning. Some of these metals have good earth connexions—in fact, gas and water supply-pipes have excellent "earths," owing to the extent of their ramifications underground; and it is a matter of considerable difficulty—in fact, in some cases practically impossible—to make the "earth" of the intended conductor as good as these accidental ones unless we actually connect the conductor to the underground mains. This is the common-sense view of the matter. It is no use for a manufacturer to tell you that with his patent coupling, or serrated earth plate, or what not, he can guarantee that sparks will not pass off to accidental conductors placed dangerously near it. If he says that, he either does not know what he is talking about or he is guilty of a deliberate falsehood in order to sell his wares. There is nothing magical about a lightning conductor; it is merely the adaptation of the known laws of nature to the use of mankind. If you fixed one conductor to the highest part of a building, and another one, say, 6 ft. up the wall, and approaching within a foot or two of it at that point, and both with equally good earth connexions, I do not suppose you would be surprised if the lightning divided and part went down one conductor and part down the other, or, if brickwork intervening, a hole was made through it. Why, therefore, should you be surprised if, when arranging for your lightning conductor, you take no heed of the metal inside the building, and place one conductor down outside and another one in the form of a gas-pipe inside, and the discharge divides between the two, knocks a hole in the wall, and sets light to the gas? Lightning has to follow certain unalterable laws, and one of those laws is that if two or more paths are provided, it must divide between them. It is no use labelling or calling one the lightning route; that will not alter the law. Out of the many cases of true failure of lightning conductors that I have examined I have found that 90 per cent. have been due to neglect of this common-sense view, as I call it. It is no argument against the use of conductors that the discharge will divide between accidental and intended paths. It merely shows the necessity for arranging the conductor so that the faults which lead to the division of the discharge shall not exist. If such faults do exist, it is obvious that the damage should be very much less, and never in any case greater, than if the conductor had not been applied at all. But this is poor philosophy. We should arrange so that the division shall not take place. We cannot prevent a building being attacked by lightning—any structure, from a cathedral to a hencoop, may be struck. All we can do in this respect is to provide our conductor with points (and the more the better) to lessen the liability of its being struck. We can, however, go further than this. We can, by carefully studying our building both inside and out, arrange our conductor system so that the lightning shall go harmlessly past it through our conductor and leave our building and its contents secure. That is unless somebody who does not understand the matter comes along and alters the conditions that we studied, and so makes our system less effective. Before going further into the matter I must draw a distinction, as Snow Harris did, between side flash to other paths and sparking to metals which do not afford an alternative path, though not agreeing with him as to the impossibility of the latter. In order to make the matter more clear I must dip a little into theory, though I do not think it necessary to go very far.

There is nothing mysterious in lightning sparking through to a gas or water pipe or other metals the other side of a wall. It is not chance, or instinct, or any other quality not explainable by scientific laws. We must reason the matter out by the use of the faculty of imagination, for I know of no simile which would serve to bring the matter to your minds. As Professor Tyndall once said of another scientific matter:—"The question leads us beyond the region of sense and into that of imagination. This faculty, indeed, is the divining rod of the man of science. Not, however, an imagination which catches its creations from the air, but one informed and inspired by facts, capable of seizing firmly on a physical image as a principle, of discerning its consequences, and of devising means whereby these forecasts of thought may be brought to an experimental test. If such a principle be adequate to account for all the phenomena, if from an assumed cause the observed facts necessarily follow, we call the assumption a theory, and, once possessing it, we can not only revive at pleasure facts already known, but we can predict others which we have never seen. Thus, then, in the prosecution of physical science, our powers of observation, memory, imagination, and inference are all drawn upon. We observe facts and store them up; imagination broods upon these memories, and by the aid of reason tries to discern their interdependence. The theoretic principle flashes or slowly dawns upon the mind, and then the deductive faculty interposes to carry out the principle to its logical consequences. A perfect theory gives dominion over natural facts; and an assumption which can only partially stand the test of a

comparison with facts, may be of eminent use in enabling us to connect and classify groups of phenomena." So in the present case we must exercise the faculty of imagination in order to understand what takes place, and if we are omitting certain conditions or considerations which afford a fuller explanation, still, if it enables us to grasp a general idea, and assists us to understand the matter, we shall be in a better position.

When the conditions are proceeding which lead to a discharge of lightning occurring, induction, as I have already pointed out, takes place, that is to say, there is an enormous difference of potential between the cloud and the building about to be struck; this inductive action is stronger in conducting than in non-conducting masses, therefore the lightning conductor and other metals would show this action better than brickwork. If the metal is connected to earth the action would be quick, if the metal is insulated the action would be slower, because the charge would have to filter through the insulating material gradually. Suppose that we have a lightning conductor, and near it, say, a metal safe. Let us suppose for the sake of argument, that the value of this induced charge was 1 (if the cloud was positive the induced state would more properly be described as a minus quantity, but it will be more simple if we regard it merely as 1) both in the lightning conductor and the safe. Then comes the discharge, the conductor has its potential raised suddenly at the moment of receiving the flash to, say, 1,000, but the safe, which is insulated remains practically at 1. There is then a big difference of potential between the conductor and the safe, one being 1,000 and the other 1, therefore there is a strain, and if the safe is near enough a spark passes knocking a hole through the wall so as to bring the potentials nearer in value. Let us say that the safe is raised to 800. In the meantime the discharge has died out in the conductor, and this returns to 1; but the safe is 800, so that there is still a difference of potential but the values reversed, and a spark passes back. So backward and forward should the spark pass—possibly half-a-dozen or a dozen times in a minute fraction of a second, a fraction so minute that we could not detect the alternations, and we should perceive only one spark, until the two objects arrive at about the same potential, when the tension dies out. This would be an oscillatory spark. If we connected the safe and the conductor together by a piece of metal, these oscillations would take place through the metallic connection, and there would be no visible effect, unless, say, we had another safe a few inches away from the first one, when there would be again a difference of potential and resultant sparking. Again a third safe near the second and the same thing would occur—in fact, this might be carried on from one to another to a considerable distance, providing each succeeding interval between the safes was less than that preceding it, and sparks would pass between each, but at each interval the spark would be weaker, till we should get to a distance at which no spark would pass.

Let us suppose another case—a long piece of metal, say, 20 ft. in length, connected at one end to the lightning conductor but not otherwise connected to earth. At the moment of the occurrence of the flash the potential of the conductor would be raised, and also that of the long piece of metal; but the rise in the latter would occur at the end connected before it did at the other, therefore we should get an alternative rise and fall of potential at the ends of this piece of metal, or what Dr. Lodge calls a surging effect, but this would be harmless unless another piece of metal at a different potential came near it. If it did there would be sparking. Even if the long piece of metal was not actually connected with the lightning conductor, but just so far away that a spark would not pass to it, there would still be the same surging effect caused by induction, and if other metal approached close to the other end there would be difference of potential and consequent sparking. These are instances of local sparking only, and do not indicate that any part of what we may call the lightning has left the conductor to go to earth by another route. This sparking is not as a rule a very serious matter. A small hole may be made through brickwork or other intervening non-conducting matter, but that is about all, unless some inflammable material intervened, when a fire might be caused.

Now we come to the question of division of a discharge between a lightning conductor and other paths to earth, which form what I call accidental conductors. Given a lightning-conductor outside and a gas or water-supply pipe near to it inside the building, and this is a very different matter. The action as regards difference of potential and consequent strain and resulting spark is somewhat similar; but the sparking distance is very much longer, and the spark more powerful, because it is actually a portion of the lightning discharge passing. If we knew the respective inductive resistances of the intended and accidental conductors, we could gauge approximately what proportion of the discharge would go to earth by the former and how much by the latter. But even if you got nineteen-twentieths of the discharge through the former and one-twentieth through the latter, it might be a serious matter. I may here refer again to Dr. Lodge's suggestion that metals should be connected to earth and not to the conductor. Let us take again the question of the safe near the conductor. If it was neither connected with the earth nor the conductor we should only get local sparking, as I call it, but suppose we connected the safe to earth and not to the conductor, we should get an alternative path to earth provided by which actual division of the discharge would occur, and this would be a far more serious matter. Besides this, the sparking distance would be increased enormously, so that objects which would otherwise have been at a perfectly safe distance would be in dangerous proximity. On the other hand, the indiscriminate connexion of metals would be almost as fatal.

Now as to the methods for rendering our system of protection perfect. We must first of all decide on which are the parts of the building liable to be struck by lightning, and protect them either by separate conductors or by branch conductors carried to one or more mains to earth as may be necessary, and we must see that these conductors afford as little resistance as possible. The joints must be soldered so that they will not only be perfect at the time they are put up, but will remain perfect. The earth connexion must also be made so that this path is at least as good a one as other paths about the building; and besides this we must carefully study our building, both inside and out. We must take into consideration all the metals used in its construction, both as regards their relation to the conductor system and to one another, and take such precautions that neither division of the discharge shall occur unless we intend it to occur, nor sparking in places where sparking would do harm. It is here that the skill and experience of the expert have to be displayed, and I cannot give you any rules for your guidance on this matter, for buildings differ so much in their construction and arrangement that rules applicable to one case would be absolutely useless for another. Nothing is of use but knowledge and experience, and as I have already indicated, these cannot be imparted or acquired in a short space of time. I can only say that in some cases connexions are made and in others the dangerous metals are avoided, but that great discrimination is required as to what metals are connected and what avoided. Sometimes dividing the discharge between several paths or over a wide extent is the best plan, and sometimes other plans are adopted according to the exigencies of the case or the particular combination of dangers which one may find to exist.

So far I have only touched on what I may call the fringe of this subject. Time will not allow of going much further, though there are many questions, such as the making of earth connexions, which are often misunderstood, and in which the methods of procedure sometimes adopted differ widely from the scientific and common-sense methods. I may, however, in conclusion, discuss a matter which is of great importance to architects, and that is as to what parts of a building are liable to be struck, and which therefore require protection. When we have an important public building to protect, and cost is of no importance, we may be tempted to run conductors in all directions and protect all parts whether likely to be struck or not. It is not often that over-protection will do any harm, though it may do so if the matter is not properly done. In the majority of cases cost is, very properly, a serious consideration, and we do not want to add a penny more to the outlay than is necessary to secure efficiency. It is therefore important to know just what are the places liable to be struck. I have devoted many years to this question, and have examined many thousands of buildings which have been struck, first with the object of formulating a theory, and afterwards to prove that theory, and I propose putting this before you as briefly as possible. The main principles are simple, and possibly it is the very simplicity of the matter which has led to its being overlooked. The popular idea is that it is the highest point of a building which is struck, but probably some of you may have met with cases in which others very much lower have been damaged. I have come across hundreds such. The explanation is that the nearest part of the building to what I may call the point in the cloud from which the discharge originates gets struck, and the highest is not necessarily the nearest. A discharge occurs between two planes or points one of which is in the clouds and the other is in the ground; the building is merely an object en route, as one might say, which forms a path of less resistance than the surrounding air. Now, a lightning-conductor does not attract lightning except inasmuch as, being of metal, induction and consequent difference of potential takes place more strongly in it than in the surrounding non-conducting materials, and in this respect the thin line which is intended to protect the building from lightning is insignificant compared to the other metals used in its construction. Brickwork, although non-conducting to a certain extent, offers a lower resistance than air. Therefore it would be contrary to science for a discharge to pass over a chimneystack or gable-end to strike a lightning-conductor merely because it is metal when probably the gable-end or chimney has a much larger extent of metal just below it. Even if the lightning-conductor affords the best path to earth, the path of least resistance would be through the gable-end or chimney and the house to the conductor, rather than through a corresponding distance of air, to get to the top of the conductor. We have to consider two kinds of discharge, one the most dangerous type, which occurs fairly straight through the air in an almost vertical line, and the less dangerous flashes which occur in a somewhat oblique line, and are generally meandering in their course. These latter flashes are often called forked lightning, though this is a misnomer, and are popularly, but mistakenly, supposed to be the most dangerous. It is the straighter flashes which do the most harm; those which are capable of breaking almost straight through the air without having to go out of their course to take advantage of any little conducting matter, such as moisture, which will assist them on the way. The meandering flashes are not by any means to be ignored, it is only in comparison with the straighter ones that they are mild.

In arranging what parts of a building require protection, we have to consider the various points in the sky from which the discharge may originate, and so arrange our system that the conductor, or one of its branches, will form the nearest part, no matter from what direction the discharge may come. There is, of course, a limit to the angle of obliquity, and this limit should be about 40 deg., and my observations have led me to infer that the greater the angle of obliquity the milder the discharge. We hear reports sometimes of buildings having been struck by lightning in absolutely unaccountable places, such as lightning missing a tall spire and striking the nave close underneath it, or even striking through a window. Like all other so-called vagaries, freaks, or perversity of lightning, such peculiarities do not exist except in the minds of people who do not understand the matter. For a dozen years past I have been scouring the country to try and discover a freak of lightning; plenty are reported in the papers, but on investigation they all prove to be ordinary enough, and merely what one could have predicted had one been informed of the circumstances beforehand. Lightning is a force of Nature, and, like all other natural forces, is governed and regulated by laws more unchangeable than those of the Medes and Persians; therefore if we find cases which do not quite agree with our preconceived ideas, we must admit that we either do not know the law, or that we have overlooked some important factor of the case, and not put it down to a sudden and capricious change in the laws of Nature.

I have prepared a rough sketch showing a house with a turret and gable ends, a tree, a wall and a hen coop, placed in a line and so

arranged that either may be struck according to which is the nearest object to the point overhead from which the discharge occurs. These are all objects which I have known to be struck by lightning, and I have heard great surprise expressed sometimes that the lower object should have suffered and the higher one, not so very far off, have escaped. In arranging as to which parts to protect, therefore, we can consider this question as to which would be the nearest parts, and we can take it that these are parts which might be struck, other parts between them in height may be absolutely safe if they come well within a line drawn from one to the other, provided other circumstances are equal; but they may not be, for metals either inside or outside the building and other circumstances may complicate the question so far that this rule does not entirely apply. Here, again, the expert requires to weigh carefully the whole circumstances, and nothing but knowledge and experience will enable him to decide accurately which places may safely be ignored and which may not. Notwithstanding all the difficulties that I have pointed out, absolute protection is possible if the building is thoroughly studied. We can either protect it so that we can say not a brick or stone shall be disturbed, or we may say we will protect it so that the inmates shall be safe and the building shall not be set on fire or damaged to any extent—we may say that a stone finial at this end may be knocked down, or a few bricks or tiles disturbed there, and that we will risk that as we do not consider this damage worth providing against, but if we do this we must realise that we are running the risk, and if the stone finial is thrown down, or the bricks or tiles displaced, we must consider that we deliberately took the risk, and that it is not a failure of our system of protection. In conclusion, I can only advise you not to make the general error of providing your conductors of exceptionally large size under the mistaken idea that by providing your conducting path of exceptional capacity as it is wrongly called, you can ignore the scientific aspect of the question, for no increase in size of the conductor will compensate for this, and unless you are prepared to devote a number of years and a large sum of money to a very close study of the subject you must be prepared to abide by the opinion of an expert who has acquired the necessary knowledge, and be guided by him, confining yourselves to a close supervision of the work, and to seeing that it is being carried out in a way which will not only render the work efficient when it is completed, but will remain efficient until accident, decay, or the interference of people not acquainted with the subject has impaired its efficiency.

The following communication was also received from Mr. Killingworth Hedges, M.Inst.C.E.:—I have read Mr. Hands' paper with great interest, and think he has brought to the notice of the members of the Architectural Association a problem which, as he rightly says, "is all the more difficult the longer you study it." I quite agree with his remark as to the immense amount of damage to property which annually occurs through lightning strokes, much of which might be prevented if efficient lightning conductors were installed. Most people think that almost every church has its conductor, when not 10 per cent. are so provided, and in the case of public buildings the proportion is much less. There is a sort of go-as-you-please policy which seems to be the rule with regard to lightning protection. Insurance offices do not seem to care whether a building is protected or not; no individual office likes to insist on the erection of lightning conductors for fear of diverting business to its rivals. In the case of a church there is certainly sometimes a recommendation from the archdeacon that the churchwardens should put up a conductor and see that it is kept in order; but if the vicar wishes to safeguard his church the cost usually has to come out of his own pocket. Architects, too, as a rule, put the erection of lightning conductors in a few lines at the end of their specification, and say nothing as to the way they are to be run or as to the necessity of good earth and of constant inspection, and then we wonder why a building provided with a so-called conductor is struck! The author has mentioned the advantages of having many points, but then goes on to say "that they may not be able to prevent discharge." This inability is, in my opinion, only a question of their number, as usually installed, without regard to interconnexion. Some may be inefficient, but on a properly protected building the number of points should be so distributed that the whole building is bristling with the so-called negative discharge, and therefore an actual disruptive effect is warded off. I have endeavoured to carry this out in the protection of St. Paul's Cathedral, where there are over a hundred points all connected with one another and at intervals to earth. So convinced am I that this is the correct system that in the work now being installed under my supervision at Westminster Abbey the actual number of points in proportion to the area will be still greater. I have already alluded to the researches of Dr. Oliver Lodge in my paper entitled "The Protection of Public Buildings from Lightning," read before the Royal Institute of British Architects on April 23 last year,* and I beg to refer those interested to my concluding remarks under the head of "Practical Questions," in which I have slightly altered Dr. Lodge's rules and added some of my own.

The Chairman said they had listened to a very interesting paper of a practical and scientific character. It was impossible for architects to understand as an expert would the theory of such a subject, but it was necessary, for the proper carrying out of their works, to have a general knowledge of it. The lecturer, by his remarks, diagrams, and lantern views, had indicated certain principles which had been found essential to the protection of buildings from lightning. The point which interested them most of all was that of how to deal with conductors so that they should not disfigure buildings. In Germany and France conductors were of enormous size and height, and there were very many of them—out of all proportion to the number to be seen in this country. It was very difficult to design a refined flèche or any high sky line which would not be injured by a lightning conductor.

Major-General E. R. Festing, C.B., said what was wanted was a more proper record of facts with regard to lightning. He was present that evening as a member of a committee lately formed to collect facts in regard to the matter, and he believed that some good might be done in that way. The accounts generally to be got of damage done by lightning were often of a very unscientific and sensational character, and the Committee hoped to enlist the services of men who were qualified by position or training to record properly these facts, and who would be interested in doing so. In that way he believed the science of the matter might be much more advanced than by trying to theorise too much on the imperfect knowledge and facts we possess at present. If they could get the facts in cases where lightning conductors had failed, and tried to find the reasons for these failures—it was only by examining the matter in that way that they could make progress.

Mr. W. P. Goulding, F.R.G.S., F.S.I., said they were much indebted to the lecturer for the able way in which he had brought the subject before them. He had gone through that weary book, the Report of the Lightning Rod Committee; and those who did so must be surprised at the great diversity of opinion on the part of the scientific men who constituted the Committee. The subject was one about which very little was known. A lightning flash was such an erratic, elastic, and elusive thing that it could not be pinned down. No two flashes were of the same duration, potency, or velocity; but, for all that, we tried to cope with it. In France they erected strong, high conductors, and the effect on buildings caused by them must be considerable when the wind was blowing heavily. He believed that 75 per cent. of our churches had no conductors, and while this was so, and people would not take the trouble to protect their buildings, the data needed on the best method of doing so could not be obtained. Generally speaking, the architect or surveyor could not get the building-owner to go to the expense of a conductor, while the insurance companies paid for losses caused by lightning. The speaker then gave a brief sketch of what he considered a safe and sufficiently protective conductor for all ordinary buildings.

Mr. John Slater, in proposing a vote of thanks to Mr. Hands for his interesting paper, said he was almost disposed to think that Mr. Hands had so often been engaged in examining the destruction caused by lightning that his paper had been fuller of destructive than of constructive criticism, and he (the speaker) wished that had not been so much the case. The historical account Mr. Hands had given of the matter and the various theories accounting for destruction had been very interesting, but what was wanted was the knowledge how best to protect buildings from lightning. The statement made as to the amount of damage in £ s. d. caused in England during the few years that Mr. Hands had been investigating the subject showed what an enormous amount of loss there was from the effects of lightning; and if means could be found and adopted for diminishing it to any extent it would be a great advantage to the architect and the general public. The most interesting matter to investigate was, as Major-General Festing had said, the case of buildings which had lightning conductors and yet got damaged; and what was wanted to be ascertained and thoroughly known was to what extent lightning conductors would protect buildings, and when they did not what were the reasons. In one remark made perhaps the lecturer was not quite exact. When Mr. Hands said that a lightning conductor was not struck, he (the speaker) supposed he meant it was not struck by a discharge which looked like a stroke; but, as a matter of fact, the conductor was continually attracting the electric current from the clouds to the ground, and if it did not it was not acting as a conductor. In regard to the statement made some years ago by Dr. Lodge that copper conductors were doomed, he thought that Dr. Lodge would say that he had seen reason for changing his views, for there was not the slightest doubt that copper lasted longer than iron and was, therefore, more economical. Mr. Hands said that the question whether a discharge from a lightning rod was oscillatory or not was not of great importance, because the lightning did not instantly change its character. That might be very true in one sense, but, undoubtedly, the character of the discharge and the effects of the stroke did vary very considerably. He would have been glad if Mr. Hands had given them some more practical hints at the conclusion of his paper. One of Mr. Hands' diagrams appeared to prove a little too much, for to tell which part of a building would be struck one needed to be an expert in clouds. It was all very well to say that if the point of discharge was immediately over a particular building that that building would be struck, but that was begging the question altogether. Architects and others wanted to protect buildings, no matter where the discharge might be. Mr. Hands apparently argued that buildings could be over-protected. He (the speaker) did not see how that could be, and it seemed to him that to be safe every part of a building should be protected, and not only that part immediately under a possible point of discharge. One extremely difficult matter to be dealt with was as to finding out the position of all the metal in a building. One might be consulted about a building where no lightning conductor had been fixed; they could find out where metal was both inside and outside; but how could they get to know where cramps, &c., existed inside the walls, near which the conductor might be placed? In the case of a tower or steeple, damage was frequently caused by the metal inside the stonework being near the path of the lightning as it came down the conductor. As to the Chairman's remarks about the difficulty of getting an artistic form of conductor for an elegant flèche, it seemed to him that architects might copy the means which large chimney constructors frequently adopted. They had a cast-iron cap above the chimney-shaft into which the points forming the lightning conductor were soldered. He thought that the top of a flèche might be covered entirely with metal, where the points to break a discharge might be fixed in considerable numbers. They would not be at all unsightly, because they would scarcely be seen from the ground. The committee to which Major-General Festing had alluded had been formed on the initiative of Mr. Killingworth Hedges, and with the concurrence of the Institute of Architects and the Surveyors' Institution, with the object of endeavouring to collect material to form, if possible, a sound theory as to lightning strokes. The aims of the committee could be obtained from the Institute and a copy of questions which the committee desired to get answered, showing the data which were wanted. Any useful suggestions would be received with pleasure,

* See our issue for April 28, 1900.

because the more facts they could ascertain as to the action of this extraordinary and erratic fluid, the better would the committee be able to put forward their theories. The difference between theory and experience must not be carried too far. It was no good having a theory and then finding that the facts would not suit it; they must collect the facts and then base a theory on the facts; and the more information and the more exact that information, the more likely that the labours of the committee would be successful.

Mr. G. H. Fellowes Prynne seconded the vote of thanks. When experts differed, as Mr. Hands had shown they did, it was hard for architects to agree as to what was the best means to adopt for the protection of buildings from lightning, and it would be of great value if the newly-formed committee obtained the necessary data on which to base their theories. It would be interesting to know what Mr. Hands considered were the best metals to be connected up with the lightning conductor, and also whether he knew of any cases of lead gutters or roofs specially attracting lightning —whether the lightning was attracted by the masses of lead. Did Mr. Hands consider it advisable to connect the lightning conductor in any way with the lead pipes? The lecturer's remark, that it was unwise to connect with soft metal, seemed contrary to experience. Rain-water pipes, by being connected up to lightning conductors, could be made most valuable channels for lightning discharges, as he knew from experience. In a church he built some five years ago in Cornwall the copper-covered spire, protected at the top, was struck by lightning immediately underneath the tower, on the ridge of the nave roof, close to where the secret gutters were. The discharge was carried down the rain-water pipe, and although it did some damage to the roof it did not set it on fire. Was a lake or water near a building any protection to that building? Did Mr. Hands know the distance a lightning spark would go from one metal to another?

The vote of thanks having been agreed to,

Mr. Hands, in reply, said that as to the French lightning conductors, the French idea had always been that there was a cone of protection afforded by conductors, the base of which was nearly twice its height, and on that ground they generally had their rods about 30 ft. high, placed all over a building. The appearance was most unsatisfactory, and the conductors did not afford any better protection than was afforded by the English method of having points where necessary. He quite agreed with the Chairman that an ordinary lightning-conductor rod was a most unsightly thing when put on a flèche, but then it was absolutely unnecessary; the idea was far too prevalent that a lightning conductor must terminate in an elevation rod. A vane was a perfect conductor, and it was not necessary to have an elevation rod on that; it was quite sufficient if the conductor was properly connected to it. The theory of a cone of protection had been sometimes misrepresented. Dr. Lodge had said that the cone of protection was quite useless because you can draw sparks from the lightning conductor. That had nothing to do with the matter; the theory was that lightning would not strike any point within a certain cone. In regard to the diagram Mr. Slater had referred to, what he (the speaker) wished to show was that there were certain parts of a building which were liable to be struck by lightning, and one could tell on examination what those points were. He had tried to reduce the matter to a science, and one did not require to be "an expert in clouds" to understand the matter; one could look at a building and study the question of what part a discharge was liable to come from and what part of the building it would strike if it did come. As to Mr. Slater's remark that more of a practical character might have been said in the paper, that was the difficulty. He thought it desirable to say something of the history of the matter, because the history contained the information one required and he also wanted to place before them the facts as between iron and copper conductors and the arguments of Dr. Lodge. In doing this he had been compelled to reduce the length of his paper. Mr. Slater asked how over-protection could do harm. Well, it could do harm under certain circumstances. In the case, say, of a church spire: in the ordinary way it would be protected by a single conductor, which if properly applied would render it absolutely safe, but conductors might be taken down the four sides for the sake of extra security, and then there would be a good chance of one of the conductors being within sparking distance of metal in the building, whereas with one conductor the building could be kept safe. As to what metals should be connected, that was a matter that could not be decided by rules; each building must be studied individually as regards the metals in their relation to the conductor and to one another. Lead did not attract lightning; in fact, metals did not "attract" lightning at all. All metals on the outside of a building should be kept in contact with the conductor, and it was perfectly safe to connect lead gutters, &c., or iron rain-water pipes. At the same time, the inside of the building must be studied in order to see what metals there were and what ought to be brought into the conductor system, or avoided. He did not think any rules could be given as to a safety distance of metals in the case of sparking. It depended on the extent of the metals and where they led to. All he could say was that local sparking from a conductor to insulated metal such as an iron cramp would be a matter of inches only, and the damage might be so slight that it might not be noticed at the time, but division of a discharge between a well-earthed conductor and a gas or water supply-pipe would occur to rather over 4 ft., and considerably further if the conductor was not well earthed.

Officers for next Session and Votes of Thanks.

The Chairman then read the result of the election of officers and committee for session 1901-1902, as follows:—

President, Mr. W. Howard Seth-Smith.

Vice-Presidents, Messrs. G. B. Carvill, and E. Guy Dawber.

Committee, Messrs. A. T. Bolton, F. D. Clapham, W. A. Forsyth, H. T. Hare, Hon. A. McGarel Hogg, Arnold Mitchell, W. A. Pite, G. H. Fellowes Prynne, W. H. Raffles, and E. Howley Sim.

Hon. Treasurer, Mr. Francis Hooper.

Hon. Librarian, Mr. F. J. Osborne Smith.

Hon. Secretaries, Messrs. R. S. Balfour and H. P. G. Maule.

The above form the Committee. The other officers are:—Hon. Solicitor, Mr. W. H. Jamieson; Hon. Assistant Librarians, Messrs. C. H. F. Comyn and W. A. Jeckells; Hon. Auditors, Messrs. E. Greenop and Guy M. Nicholson; and Secretary and Registrar, Mr. D. G. Driver.

Mr. G. H. Fellowes Prynne said he desired to propose a very hearty vote of thanks to the President for his services during the past session. He was quite sure that there was no member of the Association who did not feel that during his term of office the President had carried out his duties most thoroughly, and with a genuine love for what he had done. Their President's year of office—to be extended for another year — would always be remembered as an epoch-making year, for during that time they had initiated the scheme of day classes foreshadowed in the President's opening address. They all hoped that those classes would meet with the success they deserved, and it was no small honour for a man to have his name associated with such an epoch-making year in the history of the Association.

The vote having been very heartily agreed to,

The Chairman in reply said it had been and was the greatest pleasure to him to do all he could to forward the work of the Association. In that work he had been most ably seconded by every member of the Committee, by the officers, by the cordial support of the general body of members, and last but not least by the ability and energy of their esteemed secretary, Mr. Driver. He sincerely hoped the day classes would prove successful.

The Chairman then proposed votes of thanks to the hon. secretaries (Messrs. G. B. Carvill and R. Shekleton Balfour), the vice-Presidents (Messrs. W. A. Pite and R. Elsey Smith), hon. librarian (Mr. Arthur S. Flower), the editor of the Architectural Association *Notes* (Mr. G. H. Fellowes Prynne), the sub-editor (Mr. H. A. Satchell), the School of Design visitors, the Education Committee, the Education Board, the Royal Institute of British Architects (for the use of the Meeting-room), and to Mr. E. W. M. Wonnacott for working the lantern during the session. The hon. secretaries and the vice-presidents had toiled assiduously to further every project brought forward for the good of the Association, and they had done admirable work. The hon. librarian, as they all knew, had done more than ordinary work in getting the library into order in consequence of the rearrangement of the premises, and the Association was very much indebted to him and to his assistants for the excellent work they had done. Mr. Prynne's services as editor of the *Notes* were worthy of special mention, for he had carried out his duties with a thoroughness which distinguished all he did. Mr. Prynne had been most ably assisted by Mr. Satchell, who had done much hard work in sub-editing their journal. The School of Design visitors gave much prestige to the educational work of the Association, and thanks were due to them and other educational bodies for what they had done.

A vote of thanks was also passed to the scrutineers of the votes given in the election of officers,—*i.e.*, Messrs. H. G. Collins, C. W. Beaumont, A. A. Carder, and W. A. Jeckells.

The meeting then terminated.

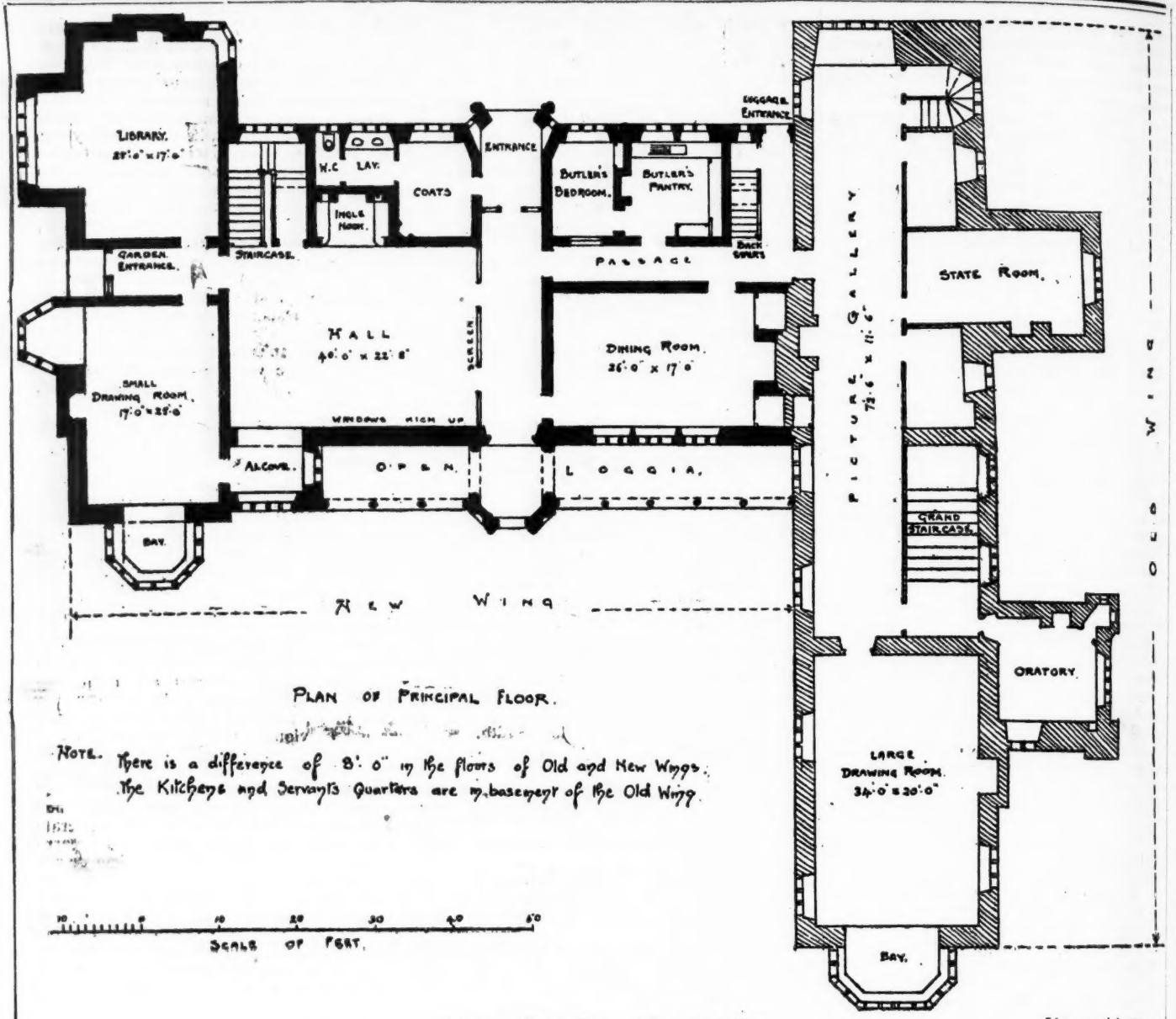
We have received from the Architectural Association a circular in relation to their newly-started day classes in architecture. The Advisory Council consists of eighteen of the leading architects of the day, including three Academicians, viz., Professor Aitchison, Mr. T. G. Jackson, and Mr. Aston Webb.

The following are among the special advantages claimed, and we think rightly, for this course of study:—

Architects feel that pupilage should be preceded by some elementary training preparatory to an office career. Pupils are frequently unable to take advantage of the opportunities offered in an architect's office because they have not previously studied the elements of their work; consequently they are only beginning to learn something about architecture when their articles terminate. A year or two spent in such a school as is now established will enable a student to acquire, at moderate cost, the rudiments of his work, before learning in an architect's office the practical details of his profession. The school will have the further advantage of testing the student's aptitude for the profession. If he should find the work uncongenial he can abandon the pursuit of architecture. Many architects do not care to receive pupils who are beginners, but they would probably take young men if well grounded. In many cases the period of pupilage might be shortened. Students already articled and unable to attend the studio regularly can make special arrangements for partial attendance if desired. In this case they are also advised to attend the evening lectures. The students will be under the direct control of a thoroughly-qualified architect as master, assisted by such staff as may be necessary.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—The sixth and concluding lecture of the course on "Works Management" was delivered by Mr. A. H. Barker, Wh.Sc., B.A., B.S., at the Westminster Palace Hotel, on April 25, the Vice-Chairman of the Institution, Mr. Ernest King, presiding. The lecturer continued the consideration of the question of cost accounts, treating it with special reference to establishment expenses. The methods necessary to obtain accurate results were indicated, and possible sources of error pointed out. Specimens of the books required were illustrated. The principles of the determination of depreciation charges were discussed at some length, and the desirability was urged of reducing all costs to a common basis, and plotting them in the form of curves from which it would be possible to deduce a law, according to which the costs would vary. The various matters involved in the process of estimating were then entered into, the important bearing upon it of a proper system of costkeeping being dwelt upon. At the conclusion of the lecture a vote of thanks was accorded Mr. Barker, and it was announced that the six lectures would be published by the Institution at the earliest possible date. On May 3 a meeting of the Institution was held at the Westminster Palace Hotel, the Chairman, Mr. Percival Marshall, presiding, when the Northcott Prize paper on the question of "How may the best efforts of Employers and Employed be exerted for their Mutual Advantage and for the National Benefit?" which had been awarded to Mr. William Powrie, was read and discussed. The



Welburn Hall: Plan of Principal Floor. [See next page.

adjudicators were Mr. J. A. F. Aspinall, of Manchester; Mr. A. Denny, of Dumbarton; and the donor of the prize (value five guineas), Mr. W. H. Northcott, of London. The author, in commenting upon the relations existing between the employer and employed of the present day, expressed the fear that each class wrongly regarded the other as an antagonist, instead of recognising that their interests were identical. The modern factory system had tended to this condition, and the increase of limited liability companies (whose proprietors had only a financial interest in them) had also done much to discourage the formation of mutual friendship. Trades-unions had not been an unmixed blessing, much bitterness of feeling having been caused by unreasonable interference between employer and employed. Referring to the attitude of the employer, it was unfortunately too common a practice for employers and managers to keep aloof from their men and to treat them as if they were of an inferior race. The workman might hold a different opinion to the foreman as to the best and quickest method of executing certain work. Due consideration should be given to it, and means adopted in every possible way to show that the men's interest in their work was not disregarded. A common cause of increased cost of production was due to the objection of the workmen to run machines at the maximum speed, their stated reason being that more men would be required to do the same amount of work, but the actual result was that future orders were sent abroad, and work altogether lost to the operatives of this country. Time and energy were often spent in devising means for reducing the cost of production, but were rendered to a large extent abortive by the indifference or covert opposition of the workman, who really had it in his power to materially aid to success. There would always be a difficulty in getting human beings, whether employers or employed, to do all they ought; but a more perfect education, the encouragement of higher ideas in both classes to assist in overcoming ignorance, indolence, and prejudice, would do much to bring about a better understanding between them to their mutual advantage and for the benefit of the nation at large.

Illustrations.

ST. ANNE'S CATHOLIC CATHEDRAL, LEEDS.

THE perspective view of the above shows the west front towards Cookridge-street, and the north towards George-street.

A full description of the proposed building was given in the *Builder* of March 9 last, together with illustrations of ground plan and west and south elevations. It may, perhaps, however, be of interest to furnish a few particulars of the present cathedral and schools.

The present St. Anne's Cathedral, which occupies a very prominent position in Leeds, is a very well-known building, and with its tower and spire at the north end of Park-row forms one of the old familiar architectural features of Leeds, which some of the old residents will be sorry to lose.

The cathedral was opened in the year 1838, the architect being Mr. John Child. The style is Perpendicular Gothic.

The interior is, considering its actual height, very successfully designed, as a great effect of loftiness is achieved by the architect; and the interior was beautifully decorated from the designs of Mr. Bentley, the architect for the Catholic Cathedral at Westminster. The reredos behind the high altar, which is in wood coloured and gilt, is very rich and effective in detail, and was designed by Pugin, and erected in 1842. The school adjoining the church was erected in 1845, and opened by Daniel O'Connell.

St. Anne's took the place of St. Mary's in Lady-lane, which was built in 1790, on what is supposed to have been the site of a Catholic Chapel dedicated to the Blessed Virgin in Catholic times.

The present cathedral is being built of Horseforth stone, a local Yorkshire grit stone. The parish church is also built of the same stone, as also St. George's Church in Leeds.

J. H. EASTWOOD.

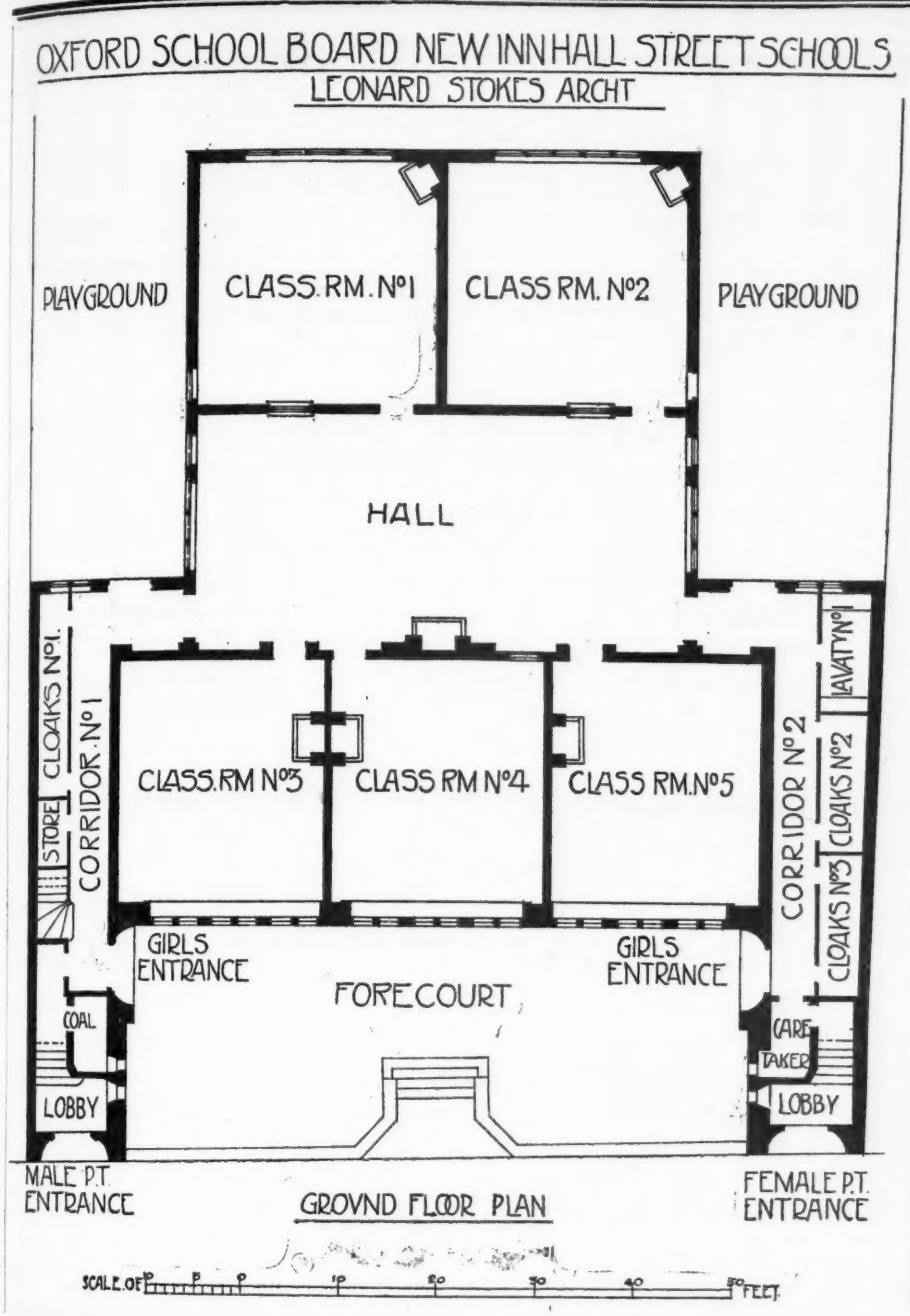
TISSINGTON HALL.

THIS is an old house dating from the time of Elizabeth, and was built by the family now living in it. The back additions are of the time of Queen Anne. The house is in the Peak district, and is a splendid example of mason's work in the beautiful Derbyshire stone. The house is full of rich oak panelling, but throughout this has been covered with painter's graining imitating the genuine article which lies beneath.

The terraced garden and the pictures here are well known, and generally the house is full of interesting things. Various works are in hand with the object of making the house a more liveable one—new roofs, new drains, heating, a kitchen, and sundry servants' rooms. The block of building on the right was an addition of the middle of last century, and without interest; its walls have been retained, but the whole interior remodelled; through neglect it had got into bad repair, and the only alternative was its demolition.

It is interesting to note that in cleaning off the panelling in portions the oak was found to be inlaid with coloured woods—satinwood, ebony, &c.

The works have been going on for a long time, and are being carried out by Messrs.



Walker & Slater, of Derby, under Mr. Chappell's supervision as clerk of works. Mr. Arnold Mitchell is the architect.

WELBURN HALL, YORKSHIRE.

THE restoration and enlargement of this house was carried out some years ago. It has since changed owners and been further enlarged.

A timber-built manor house originally occupied the site of the "new wing," which up to the Reformation was used as a retreat for the monks of Rievaulx Abbey. A part of the old moat still remains. The "old wing" was built in 1609 for Sir Thomas Robinson, who was Member of Parliament for Scarborough.

The building was a complete ruin when taken in hand, having been unoccupied for about eighty years.

The walls are built of local stone and the roofs are covered with stone slates. All the principal rooms are panelled in oak and many of the ceilings are richly modelled in plaster.

The drawing is exhibited at the Royal Academy. The plan shows the principal floor. There is a difference of 8 ft. in the levels of the "old" and "new" wings.

WALTER W. BRIERLEY.

CENTRAL GIRLS' SCHOOL, OXFORD.

THIS building has been erected for the Oxford School Board, to accommodate about 300 girls, and is situated in New Inn Hall-street. It also contains a cookery centre and a pupil teachers' centre.

The school has a stone front, and the roof is covered with Yorkshire stone slates.

Messrs. Kingerlee & Sons, of Oxford, were the builders, and Mr. Leonard Stokes the architect. The drawing is exhibited at the Royal Academy.

STABLE BUILDINGS AND COACHMAN'S HOUSE, CAVENHAM, SUFFOLK.

THESE buildings occupy the position of an old range of stable buildings to a former mansion, and are charmingly situated between the present house and the gardens. The plan shows the position of two fine old trees which were retained at the special wish of the owner.

The stable has six stalls and a loose box, and there is also a detached loose box which can be used as a sick box if required. The fittings were supplied by the St. Pancras Iron Company. The stable is well lighted, and a good effect has been got by lining the walls with green tiles and brown salt glazed bricks. Besides a large hay loft over stables, two large rooms have been provided for the accommodation of the grooms. The coachman's house has three bedrooms and a boxroom on the first floor, and is reed thatched. On the south side of the stable yard is situated the washhouse and laundry, and the whole yard has been enclosed with a new brick wall, the gate piers shown in the drawing being the only part of the former building that has been preserved.

A. N. PRENTICE.

HOUSE, DE PARY'S-AVENUE, BEDFORD.

BEDFORD is well known as a residential town, and boasts of many fine thoroughfares of which, perhaps, De Pary's-avenue is the handsomest and best known.

We illustrate a house which was erected last year on one of the few vacant sites in this avenue for Miss Collie, the principal of the High School for Girls.

The drawing-room is to the back and faces the lawn, and an attempt has been made to keep the kitchen and offices in a less conspicuous place than is usual in houses of this class, by placing them at the side.

It is built of local red bricks, and the cove and other white portions shown on the drawing are of plaster, slightly tinted with a smooth surface. The roof is covered with local red tiles, and the window-frames are of deal with teak casements painted white. The internal woodwork is Kauri pine, stained dark. All the chimneypieces and the hall panellings were designed by the architect, and the grates were supplied by Thomas Elsley & Co., Limited.

The builder was Mr. John P. White, of Bedford, and the building was completed last June from the plans and under the supervision of Mr. A. N. Prentice.

The view shown is from a pen and ink drawing by the architect, now exhibited at the Glasgow International Exhibition.

A. N. PRENTICE.

THE SURVEYORS' INSTITUTION.

THE following are the results of the Professional Examinations, 1901.

The following Student Candidates have passed the examination for the Professional Associateship :—

F. T. Allen, Lewisham, S.E.; H. Anderson, Streatham, S.W.; W. B. Aubrey, Chelmsford; H. G. Barker, Bedford; N. B. Batterbury, Berkhampstead; A. H. Bell, Addlestone; A. L. Berry, South Croydon; T. S. Bliss, Bicester; T. Brent, Redhill; E. M. Browne, London; S. B. Browning, Gloucester; A. E. Buckley, Halifax; T. L. Caton, London; A. P. Chattell, London; C. E. Chesterton, London; R. Cobb, Higham, near Rochester; H. R. E. Coker, London; C. N. Cook, London; A. G. S. Cooke, Ashbourne; †F. S. Daniel, Colchester; S. M. Deacon, Croydon; H. J. Dodd, Goring-on-Thames; J. R. F. Driver, Cambridge; C. W. Eastwood, Cheshunt; C. Fishwick, St. Leonards; J. Francis, jun., Carmarthen; R. G. Francis, Wye; A. C. Frost, Morden; S. S. Gettings, Erdington; A. Gimson, London; H. Gould, Hertford; H. C. Hardy, London; E. Harrison, Carnforth; R. Hewett, Seale, near Farnham; *M. P. Holmes, London; H. Hunt, London; C. W. Ingram, Maidstone; H. D. Kelleway, London; R. J. Lake, London; W. F. Langridge, Tunbridge Wells; E. J. W. Mellers, Chipping Norton; H. A. Mitchell, Brighton; P. A. Mytton, Welshpool; L. R. Notley, Englefield Green; A. E. Oaten, Montpelier; W. H. Overton, Brighton; S. A. Parnwell, London; G. L. Pottier, Walthamstow; A. E. Priest, Old Hill; W. H. Rees, London; G. C. Rowe, London; H. G. Smith, Maidstone; Q. C. Smith, London; H. Soper, Hove; J. K. Stephens, Holywood, co. Down; F. Stone, Wellington; A. W. A. C. Tannahill, London; S. D. Taylor, Haslemere; F. F. Tomlin, London; J. T. Turner, London; C. H. Vince, Halton; A. L. Watt, Carnforth; E. M. Whitehead, London; C. E. Widdicombe, Eastbourne; H. H. Wigley, Stroud; H. C. Wood, Cockermouth; R. H. Wood, Southend-on-Sea.

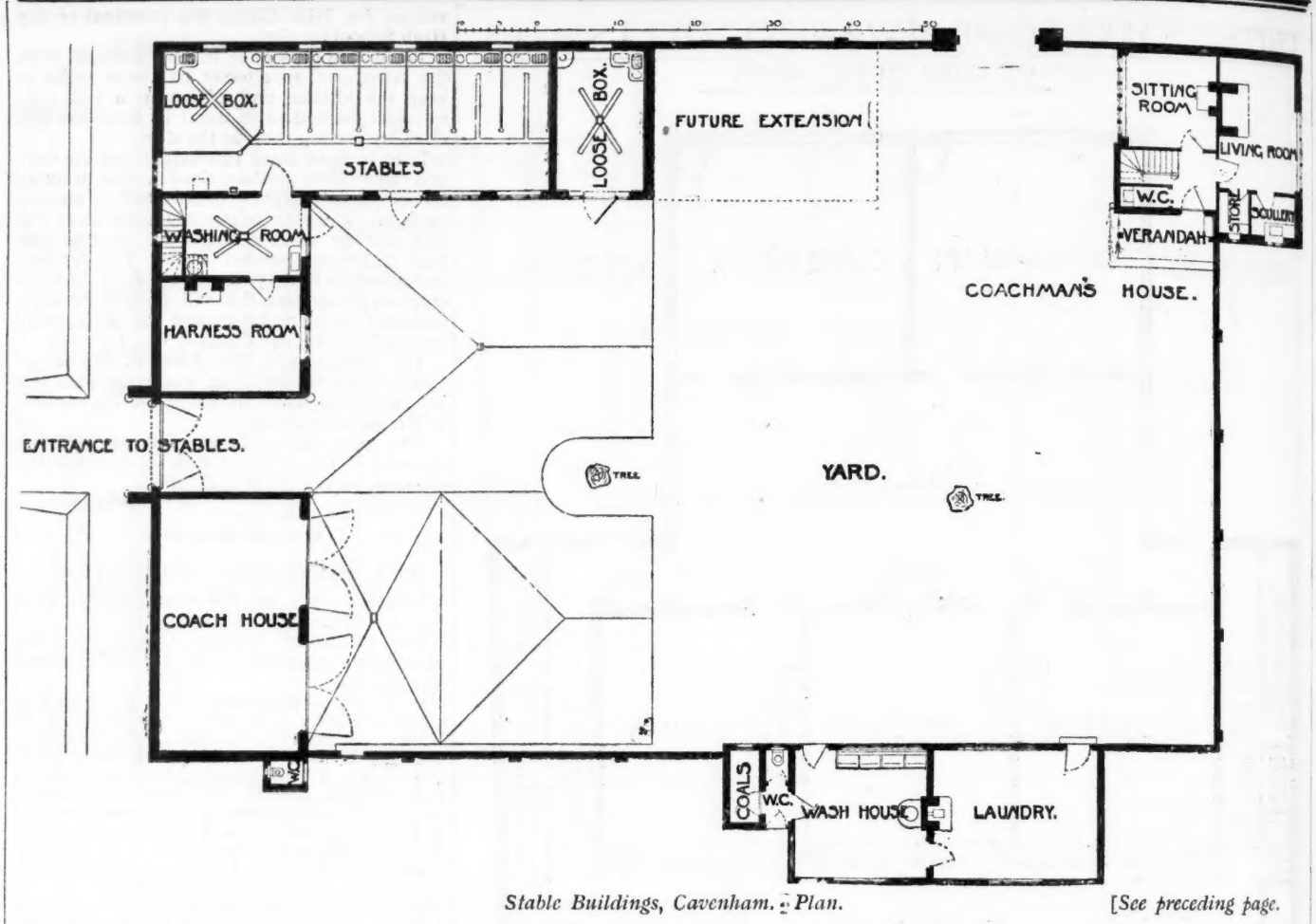
Irish Candidate.

R. B. Darley, Carrick-on-Shannon.

The following Non-Student Candidates have also passed the examination for the Professional Associateship :—

A. L. Armstrong, Harrogate; J. G. D. Armstrong, Sheffield; W. E. G. Atkinson, Wye; F. H. Austin, Theydon Bois; P. H. A. Bailey, Dudley; H. Brook, London; J. Brown, Northampton; L. J. Brown, Salisbury; R. L. Buckwell, Hythe; T. H. Bull, London; F. B. Buswell, London; C. V. Cable, Beckenham; W. D. Catleugh, Newbury; C. Chamberlain, Brentwood; J. F. Cocks, Wye; J. H. Coles, Leeds, Kent; E. A. Collis, Southport; H. T. Cooper, London; H. Cox, London; E. H. Crump, Nuneaton; E. S. W. Dale, London; C. Dalgliesh, London; C. R. Davy, Maidenhead; F. J. Dundas, Farnham; W. Edgington, Newark; J. W. F. Elliott, Salcombe; A. O. Ellis, Crowborough; R. A. E. Every-Clayton, Great Harewood; L. M. Field, Gosport; C. G. Ford, London; W. A. Foster, Accrington; J. E. Fothergill, Arnold; R. F. L. Freeman, London; W. C. Goodchild, London; A. H. T. Haines, Bristol; D. Harris, London; A. B. Hayward, London; J. S. Hazel, Bristol; F. R. Hebden, London; A. M. Hickman, Shrewsbury; G. S. W. Hinchliff, London; H. C. Hood, London; P. R. Hopkins, London; A. W. Hosegood, Williton; M. Hoskins, Carmarthen; L. U. Hubble, Hunton; W. F. A. Hudson, Fulbourne; S. Keighley, Burnley; F. A. King, London; W. S. Lake, Plymouth; F. A. Lees, London; H. G. Leslie, London; J. B. Love, Wye; A. W. H. Loveless, London; J. Luffingham, London; A. K. McGaw, Shrewsbury;

* Institution Prize, 1901. † Special Prize, 1901.



Stable Buildings, Cavenham.—Plan. [*See preceding page.*

W. Marchant, Paddock Wood; H. G. Marrion, London; W. H. Masters, Southampton; D. B. Maxwell, Ipswich; J. Michell, London; R. W. Mitchell, Wye; A. W. Moore, London; I. C. Morrison, St. Albans; C. Murdock, Wye; *D. L. Paton, London; J. Peirson, Wye; W. G. Percival, Brent Knoll; A. E. Petter, Bristol; W. T. Pilditch, London; F. W. H. Pinsent, London; F. E. Pitts, London; J. Rawlence, Wilton; J. Roberts, Chester; L. E. Salt, Shrewsbury; J. L. Schneider, Maidstone; W. G. Shipwright, London; J. W. Smith, Hull; R. Spence, Glynde; C. F. Stedman, Cranleigh; P. C. Stewart, Preston; C. W. Surrey, London; F. J. Tallboy, London; R. Tanner, London; W. H. Tanner, Beckenham; R. L. Taylor, Leighton Buzzard; A. E. Terry, Ashtead; S. G. P. Titterton, London; H. P. Ward, Redhill; A. S. West, London; C. M. Wilford, Ainstable; E. J. Wilson, London; W. R. B. Wiseman, Chorlton-cum-Hardy; H. J. Wonnacott, London; H. M. Wright, Stapleford; W. B. Wright, London; H. C. Wyley, Bridgnorth.

Irish Candidates.

A. H. Lee-Norman, Ardee, co. Louth; H. J. O'Reilly, Booterstown, co. Dublin; E. A. Penrose, Ferrybank, co. Kilkenny.

Scottish Candidates.

A. J. Mirrlees, Kilmarnock; J. C. Peace, Edinburgh.

The following Professional Associates have passed the Fellowship Examination in Division IV.:—

J. H. Addie, Llanover, Abergavenny; A. Allsebrook, London; H. G. Assiter, London; F. G. Barker, London; H. P. Basley, Bickley; C. W. Berry, London; L. T. Bigg, Strathfieldsaye; T. C. Bliss, London; F. G. Brooker, Sevenoaks; A. A. Brown, Croydon; B. V. Bruton, London; G. J. Bruzard, London; H. Burr, Rushden; F. H. Burrows, Ashford; A. K. Burtenshaw, Hailsham; R. R. Burton, London; C. Chart, Croydon; F. L. Chattell, Chislehurst; N. Clark, jun., Pitt Hill; E. S. Clarke, London; W. J. Cochrane, Hetton-le-Hole; E. A. Cook, London; F. V. Cullen, Gunnersbury; C. A. Daubney, London; H. H. Dunstall, Chatham; J. W. Earle, Woolton; A. C. Ellis, London; A. E. Fair, Wigan; R. Fisher, London; H. Gale, Oxon; H. A. A. Gate, London; W. P. Genge, jun., East Grinstead; H. S. Hancock, jun., St. Austel; T. P. Hartley, London; R. C. Hassett, London; L. G. Hawkins, King's Lynn; R. F. Hindmarsh, Newcastle-on-Tyne; A. J. Hooley, Derby; A. E. Hooper, St. Albans; A. B. Howes, London; G. Howland, Amersham; G. W. Hunt, Malvern; H. D. Jonas, London; J. P. Martin, Salisbury; T. J. Meaby, Wimborne; F. E. Molyneux, Wallington; C. S. Orwin, Edenbridge; W. E. K. Palmer, New Malden; F. P. Pratt, London; H. V. Raffety, High Wycombe; D. W. Reeve, Sutton; J. Roberts, Towyn; E. W. Saunders, London; G. Stanford, London; F. W. S. Stanton, London; H. C. Stokes, London; I. Thomas, Cardiff; *W. E. Trent, London; A. R. Upsdale, London; T. B. Wacher, Canterbury; †H. A. C. Warmington, London; S. P. Wigley, Winslow; A. C. Williams, Sparsholt; R. E. H. Williams, London; J. E. Wood, Sunbury-on-Thames; H. G. B. Wyatt, Chichester.

Irish Candidates.

E. A. Gibbon, Waterford; G. P. Stewart, Dublin; H. P. Stewart, Dublin.

Scottish Candidates.

J. Mather, Brodick; H. Welsh, Motherwell.

The following Candidates passed the direct Fellowship Examination in Division V.:—

C. E. Carr, Newcastle-on-Tyne; G. B. Ewing, Edenbridge; A. Gordon, London; W. R. Hobson, London; C. E. Sturt, Wanstead.

Twenty Candidates, not included in the above list, passed the examination in Divisions II. and III. as a whole, but failed in their typical subjects. Thirteen Candidates, who passed the examination as a whole in Divisions IV. and V., also failed to pass in their typical subjects. Fifteen out of fifty-four Candidates in the various divisions who came up for re-examination in their typical subjects have failed again this year. It is open to all these forty-eight Candidates to offer themselves again for examination on their typical subjects in March, 1902.

* Driver Prize and Penfold Silver Medal.

* Penfold Gold Medal, 1901. † Crawter Prize, 1901.

ARCHITECTURAL SOCIETIES.

LEICESTER SOCIETY OF ARCHITECTS.—The twenty-eighth annual Report of the Leicester and Leicestershire Society of Architects shows that at the time of issuing the Report the Society numbered eleven honorary members (among whom are two distinguished water-colour artists, Mr. J. Fulleylove and Mr. James Orrock), forty-five members, twelve Associate members, nineteen assistant members, and thirteen student members. Mr. S. Perkins Pick has been re-elected President. The Council elected consists of Messrs. A. E. Sawday, A. H. Paget, J. Goodacre, and W. A. Catlow, members; and Messrs. A. Herbert and S. Harrison, jun., Associate members. Mr. Stockdale Harrison is Treasurer, and Mr. Howard H. Thomson Hon. Secretary.

THE CHURCH CRAFTS' LEAGUE.

THE half-yearly general meeting of the League was held on Tuesday, May 7, at the Vale Studio, Chelsea, the Bishop of Rochester being in the chair.

The subject down for discussion was "The Importance of Reality in Art and Religion." Canon Scott Holland, the first speaker, said that it was important to remember that individuality in art was not a mere eccentric detachment from the spirit of the time, but was the embodiment of the feeling of the great corporate body. In the matter of Church music, much had been said by expert musicians as to the folly of having a precentor to direct the music in churches where the organist was a competent artist. But it was not as if the art was standing alone. It was called in to *assist* the worshippers, and therefore the precentor was, for the time being, the expert. The same principle applied to all other branches of art, and it was just this that distinguished religious art from secular.

Mr. Henry Holiday dealt at length with the conditions under which the modern journeyman had to live and work. It was impossible, he said, for a man to take any intelligent interest in, or to put his heart into, his work now, because the conditions of modern commercial life had converted him into a mere machine.

Rev. Percy Dearmer, the next speaker, said that when one looked at the homes of the people, one saw an utter absence of beauty. Everything was shoddy and cheap. When one looked at the churches, one found much the same thing. Most of the fittings were made to look as if they had cost twice their real price. There was an entire absence of that reserve which went so far towards making a thing beautiful. In music, the Church had formed a tradition, and many of our greatest musicians had been brought up at our cathedrals, where that art had been carefully nurtured, even in the darkest times. The result of this on the nation was striking. For every ten persons who cared for music, there was only found one who had any appreciation of the other forms of art. Again, if the decorations of a church were so vulgar and bad that one's nerves were affected, that it was impossible to worship, one was considered affected if one said so. But if the music at a church was noisy and vulgar and in bad taste, one was considered to have a very plausible reason for staying away.

Mr. Halsey Ricardo said that art was a man's message to his fellow-men. Every artist had to learn all that his predecessors had learned, and then go on beyond them. Thus Mozart, in one age, learned all that could then be learned about music, and built up his own work on that. Beethoven in another age had gone beyond all his predecessors, and, still later, Wagner had done the same.*—A discussion followed, in which Miss Loundes, Mr. T. Stirling Lee, and the Rev. A. W. Hutton took part, after which the Bishop of Rochester spoke briefly, and in summing up the results of the discussion warned his hearers against the danger of hopelessness in thinking of the Church's attitude towards art.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Camberwell Borough Council 10,710*l.* for the purchase of lands and property; Shoreditch Borough Council 2,440*l.* for baths and washhouses; and Camberwell Guardians 50,000*l.* for extension of infirmary.

Main Roads.—The Local Government Taxation Committee submitted a report with regard to contributions from the Council towards the maintenance of certain main roads. Under the London Government Act the power and duty of maintaining about twelve miles of main roads, disturnpiked since 1870, had been thrown upon metropolitan borough councils. The Hampstead Borough Council desired the County Council to continue to contribute towards the maintenance of such roads, but the committee recommended the Council to reply that they were not prepared to do so.

This recommendation was, after discussion, adopted.

Proposed Conference on Housing. — The Housing of the Working Classes Committee recommended that a conference of delegates from the various metropolitan borough councils should be convened, with the view of arriving at a working agreement upon the housing question, and avoiding the danger of competition between two or more public authorities seeking to acquire the same areas.

This was agreed to, and the date of the conference was fixed for June 28.

Theatre Regulations. — The Theatres and Music Halls Committee reported as follows, the recommendations being agreed to :—

"The Council, on February 9, 1892, revised the regulations made under the Metropolis Management and Building Acts Amendment Act, 1878, Section 12, with respect to the requirements for the protection from fire of theatres, houses, rooms, and other places of public resort within the administrative county of London. These regulations have, in our opinion, resulted in a great improvement as regards the safety of the public in the places of public entertainment which have been built since the year 1892. The experience we have gained, however, in the last nine years has shown us many points on which they need, in the public interest, alteration and improvement, and we have accordingly amended them. The regulations as now amended will show persons who are desirous of building a place of entertainment exactly what is required by the Council. . . . . We recommend—That the regulations made under the Metropolis Management and Building Acts Amendment Act, 1878, Section 12, as amended, be approved, and that they be sealed in duplicate."

Seating in Theatres.—

"On April 2 last we called attention to the fact that alterations were frequently made in the arrangement of the seating in the pit and stalls of theatres without any intimation being given to the Council, and at our suggestion a letter was sent to the lessees of all theatres stating that it was necessary in the public interest that notice should be given to the Council whenever it was desired to make an alteration, in connexion with the seating arrangements, in the position of the barrier dividing the pit and stalls portions of the premises. In reply we have received letters from several lessees stating that it would be extremely awkward to comply with the request, as alterations had frequently to be made at very short notice. We think that the convenience of the lessees might be met, with due regard to the public safety, if each lessee who is desirous of being at liberty to make alterations in the arrangement of his pit and stalls seating was to inform the Council of the extreme limits within which he was desirous of at any time moving the barrier between the pit and stalls. It would be easy for us to determine the limits within which the barrier might be moved without the safety of the audience in either part of the theatre being injuriously affected, and so long as alterations were kept within these limits and the regulations respecting the width of gangways and the area of seating to be assigned to each person were observed, there would be no necessity for notice to be given to the Council. We recommend :—That a circular letter be sent to the lessees of all theatres stating that, with a view to obviating the necessity of lessees giving notice to the Council on every occasion upon which it is desired to make an alteration in the position of the barrier separating the pit and stalls seating, the Council will be prepared to determine, on application being made by the lessee, the extreme limits within which the barrier in question may be moved without further notice being given to the Council."

Tenders.—The following tenders have been accepted :—

Docking and the repair of s.s. *Barking*—Mills & Knight, 1,122*l.* 12s. 6d.

Workshops, Feltham School—Herring & Son, 102*l.*

New Open Space.—The umpire having awarded 10,560*l.* upon a claim of 17,792*l.*, for the purchase of Albert-square, Ratcliff, the Parks Committee asked for authority to expend 640*l.* on laying out the grounds.

This was granted.

Workmen's Trains.—Dr. Cooper moved :—"That, having regard to the conditions imposed upon railway companies in return for concessions from taxation and the present extent of over-crowding in London, it be referred to the Housing of the Working Classes Committee to invite all the railway companies having stations within the County of London to confer with it with a view of endeavouring to arrive at a complete scheme for the extension of workmen's trains at the lowest fares; and that if a satisfactory scheme fails to be accomplished, the Committee do report its full requirements to the Council and the objection of the companies thereto."

Mr. Dew seconded the motion, which was supported by Mr. Cousins, Mr. Beachcroft, and others.

The motion was adopted and referred to the Parliamentary Committee.

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage and Projections.

Marylebone, East.—A projecting balcony at the fourth floor level, to extend along the south and east faces of a block of residential flats, to be known as Harley House, on the north side of Marylebone-road, St. Marylebone, at the corner of Brunswick-place (Messrs. Boehmer & Gibbs for Mr. C. J. Hinsley).—Consent.

Battersea.—A transept and tower on the north side of St. Mary's Church, Albert Bridge-road, Battersea, to abut upon Park-road (Mr. J. S. Quilter for the Rev. Canon Erskine Clarke).—Consent.

Battersea.—A church on the west side of Wycliffe-road, Battersea (Mr. G. H. Fellowes-Prynne for the Rev. F. L. Goslett).—Consent.

Fulham.†—Retention of a shed, used as a stable, at the rear of No. 55, Bramber-road, Fulham, abutting upon Mulgrave-road (Mr. W. H. Stilgoe for Mr. W. Roberts).—Consent.

Greenwich.—A wood and tile pent over the entrance to a house in course of erection on the south side of Manor Way, Lee-road, Lee (Mr. L. V. Hunt for Messrs. L. Whitehead & Co.).—Consent.

Greenwich.—Rebuilding of the Baptist Church, Shooter's Hill-road, Blackheath (Mr. J. Wills for the Rev. W. L. Mackenzie).—Consent.

Hackney, North.—A one-story addition to No. 291, Green Lanes, Stoke Newington (Mr. A. H. Jones).—Consent.

Hammersmith.—A greenhouse at the nursery adjoining Oak Lodge, Uxbridge-road, Shepherd's Bush (Mr. G. Trotman for Mr. J. Harden).—Consent.

Marylebone, West.—The retention of a wood and glass conservatory in front of No. 56, Circus-road, St. John's Wood (Mr. A. G. Langdon for Miss M. Studholme).—Consent.

Westminster.—A one-story porch at the entrance to No. 169, Victoria-street, Westminster, at the corner of Carlisle-place (Messrs. Edmeston & Gabriel for the London and South-Western Bank, Limited).—Consent.

Strand.—That the Erasmic Company, Limited, be informed that the Council is not prepared to permit the retention of the wood and iron sign in front of No. 117, Oxford-street, Soho.—Agreed.

Chelsea.—Retention of a wooden trellis screen at the side of No. 456, King's-road, Chelsea, abutting upon Hobury-street (Mr. T. J. Monaghan).—Refused.

Dulwich.—A one-story shop in front of an existing house and shop on the east side of High-street, Dulwich (Mr. W. J. Studd).—Refused.

Fulham.—An addition at the rear of No. 62, North End-road, Fulham, to abut upon Gwendwr-road (Mr. S. G. Goss for Mr. J. Elmslie).—Refused.

Hampstead. — A conservatory, at the first-floor level, in front of Belgrave Mansions, Belgrave-road, St. John's Wood (Messrs. W. Whiteley, Limited, for Mr. C. M. W. Turner).—Refused.

Islington, North.—Retention of an addition at the rear of No. 214, Seven Sisters'-road, Islington, abutting upon Coleridge-road (Mr. R. Midworth for Mr. J. Fortescue).—Refused.

Kensington, South.†—An iron and glass shelter at the entrance to No. 19, Bolton-gardens, Kensington (Messrs. W. T. Allen & Co. for Mr. L. Samuel).—Refused.

Lewisham.†—Four houses on the west side of Shell-road, Lewisham, at the corner of Sandrock-road (Messrs. Hodson & Whitehead for Messrs. Hodson Brothers).—Refused.

Lewisham †—A house on the east side of Bromley-road, Catford, northward of a house known as Ormonde (Mr. W. Bailey for Mr. W. H. Waggstaf).—Refused.

Wandsworth.—Five one-story shops on the south side of Lower Richmond-road, Putney, westward of Martyn's Waterman's School (Mr. F. A. Powell for Mr. A. C. Ballard).—Refused.

Westminster.—An iron and glass shelter in front of No. 137, Victoria-street, Westminster (Mr. E. Stones for Mr. A. Simner.—Refused.

Width of Way.

Lewisham.—A boundary wall on the flank of No. 38, Lansdowne-road, Lee, at less than the prescribed distance from the centre of Church-passage (Mr. G. Mitchell).—Consent.

Peckham.—Two cottages on the south side of Green Hundred-road, Peckham Park-road, Peckham, at less than the prescribed distance from the centre of the street (Mr. H. J. Collis for Mrs. McDonald).—Consent.

Kennington.—A two-story building at Fife laundry, Southville, Lambeth, at less than the prescribed distance from the centre of Priory-mews (Messrs. Reeves & Styche for Mr. S. Fernie).—Refused.

Wandsworth.—A stable building on the east side of Brewhouse-lane, Putney, at the corner of Memel-place (Mr. H. G. Leslie for Dr. Welstead).—Refused.

Space at Rear.

Peckham.—A modification of the provisions of Section 41 (1) (vi) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a house on the west side of Hooks-road, Peckham, next the house numbered 28 in such road, with an irregular open space at the rear (Mr. A. E. Mullins for Mr. D. S. Whitcher).—Consent.

Deviations from Certified Plan.

St. Pancras, South.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed erection of a stable, with living rooms over, on the site of No. 1, Doughty-mews, St. Pancras (Messrs. Thurgood & Martin for Mr. A. German).—Refused.

Lines of Frontage and Width of Way.

Woolwich.—Three houses at the south-east end of Elm-grove, The Shade, Plumstead, (Mr. A. E. Habershon for Mr. Stevens).—Consent.

Hackney, Central.†—Houses, with shops on the ground floor, on the site of Nos. 3B, 5, 7, 9, 11, 13, and 15, Tower-street, London-fields, Hackney, at less than the prescribed distance from the centre of the street (Mr. J. Hamilton for Mr. S. K. Prager).—Consent.

Lines of Frontage and Space at Rear.

Peckham.—A three-story house, with a one-story shop in front, on part of the site of No. 194, Rye-lane, Peckham (Mr. A. Garnar for Mr. W. Wilson).—Refused.

Lines of Frontage and Construction.

Rotherhithe.—A steel grain-shoot across Church-passage, Rotherhithe (Messrs. W. A. Crips & Sons for Messrs. Dudin & Sons).—Consent.

St. George, Hanover-square.—That permission be given to Mr. W. J. Smith to retain a projecting sign in front of No. 7, Woods-mews, Park-lane, St. George, Hanover-square, extending beyond the general line of buildings in that street.—Agreed.

Width of Way and Construction.

Newington, West.—A playshed in the playground of the Harper-street School, New Kent-road, Newington, at less than the prescribed distance from the centre of Arnott-street (Mr. T. J. Bailey for the School Board for London).—Consent.

* Is Mr. Ricardo quite sure of that?—ED.

Formation of Streets.

Battersea.—That an order be issued to Mr. W. M. Wilkins, sanctioning the formation or laying out of new streets for carriage traffic, on the north side of Sheepcote-lane, Battersea (for the Metropolitan Borough of Battersea).—Agreed.

Islington, West.—That an order be issued to Mr. F. Matcham, sanctioning the formation or laying out of a new street, for foot traffic only, to lead from Holloway-road to Warlters-road, Islington (for Mr. F. W. Purcell). That the name Macready-place be approved for the new street.—Agreed.

Lewisham.†—That an order be issued to Mr. J. W. Webb refusing to sanction the formation or laying out of a new street for carriage traffic to lead out of Crofton Park-road, Brockley.—Agreed.

Lewisham.†—That an order be issued to Mr. W. H. Dawson refusing to sanction the formation or laying out of four new streets for carriage traffic out of the east side of Bromley-road, Catford (for Mr. H. W. Forster).—Agreed.

Height of Buildings.

Islington, West.—A theatre building on the south side of Holloway-road, Islington, to exceed in height the width of a proposed new street to lead from Holloway-road to Warlters-road, upon which new street the building will abut (Mr. F. Matcham for Mr. F. W. Purcell).—Consent.

Cubical Extent.

Bermondsey.—The omission of double iron doors in the party walls between the north wing of a factory building known as Grange Mills, on the south side of Grange-road, Bermondsey, and the two staircases forming approaches to that wing, whereby such wing and staircases will together exceed in extent 250,000, but not 450,000 cubic feet (Messrs. Gordon & Gunton for Messrs. A. Ross & Co.).—Consent.

Means of Escape from Top of High Buildings.

Strand.—Means of escape in case of fire on the fifth, sixth, and seventh stories of an addition to the Hotel Cecil, on the site of Nos. 76-88, Strand, between Carting-lane and Ivy Bridge-lane (the upper surface of the floors of which stories are above 60 ft. from the street level), for the persons dwelling or employed therein (Mr. J. Sawyer for the Hotel Cecil, Limited).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

BOOKS RECEIVED.

THE ENGINEER OR ARCHITECT AS ARBITRATOR. By Chas. Currie Gregory. (W. Clowes & Sons.)

A BOOK OF DESIGN AND DRAWINGS OF THE COLLEGE OF ARCHITECTURE. (Cornell University, U.S.A.)

NOTES ON THE LIFE AND WORK OF THOMAS RICKMAN, F.S.A. Collected by his Son, T. Miller Rickman, F.S.A. (G. J. W. Pitman.)

TRANSACTIONS OF THE SOCIETY OF ENGINEERS FOR 1900. Edited by Perry F. Nursey, Secretary. (E. & F. N. Spon.)

Correspondence.

To the Editor of THE BUILDER.

SOUTH KENSINGTON EXAMINATIONS.

SIR,—The examination held by the Board of Education in Building Construction on the 11th inst. has caused a shock to many thousands of hard-working and earnest students throughout the country. For many years past, papers have been set increasing slightly in difficulty, but free from erratic vagaries, and on the whole covering the ground of the syllabus in a straightforward manner. That the examination was a fair one is shown by students year after year being placed in the order that their known capabilities foreshadowed. I refrain from discussing the general question of the value of the certificates and what their possession may be taken to indicate, and beg leave to quote three questions just given :—

"65. What is meant by saying that the height to which a pyramid of any building material may be raised is three times the height of a column of uniform section? Show how, by attending to a cardinal principle of construction, you can build a tower of brick or stone of very great height.

66. With reference to the previous question : A brick tower of efficient design is built on a square base 60 ft. by 60 ft. ; it is 500 ft. high. Allowing 6 tons per square foot as the safe load on a cross section, and taking 120 lbs. as the weight of a cubic foot of brickwork, what is the area of the top? What weight in tons may be safely placed on the top? Given : log. 111=2·04532, log. 112=2·04921, log. 4086=3·61130, and log. 36=1·55630. You may assume 1 ft. courses.

69. Design and sketch a double labourer's dwelling in a rural district ; show the necessary conveniences and the enclosure. The site is close to a public road. Take accurate quantities and price them."

These are samples of five that have to be completed in four hours. Now, I would ask, first, are questions 65 and 66 such as we should train students to expect in an examination in building construction, and, second, could any living man work No. 69 in forty-eight minutes? It should be noted that equal marks were apportioned to each of these questions.

HENRY ADAMS.

THE PROPOSED LIVERPOOL CATHEDRAL.

SIR,—It would seem from what appears in a contemporary—though I have searched in vain in your current number for any tidings of the matter—that some design for a cathedral church is adopted and in process of being collected for.

Not a word is there as to the adoption or adaptation of any one of the competition designs prepared for the St. John's Churchyard site.

A hope for something as stately as the effort at Truro may be too visionary, but there may be a more excellent way than cutting up interesting parish churches (Manchester, Wakefield, and Newcastle to wit), which one would prefer to see repeated than the perpetration of a huge conventicle, which, of all the designs the late competition called forth, the late lamented Bishop is said to have sympathetically striven for. I believe that another competition ought to be called for, in recognition of the fact that there is well-nigh a fresh generation of architects capable of expressing on paper the prospective requirements, and giving sound suggestions for meeting them.

A sort of church house on one side of an enclosure and a spacious and lofty cathedral on the other would be worth subscribing for, and possibly worth while competing for ; but to rush something through without giving the profession a fair chance is not quite what we may have a right to expect, and yet this is what we may come to if subscribers do not have a care that their contributions are devoted to a *bona-fide* design and not a sort of basilica. H. W.

*** We are quite in sympathy with the general purport of our correspondent's letter ; and if it be true that a design for the cathedral is to be prepared by the City Surveyor, we can only say that it is a most miserable anti-climax after the important competition held a good many years ago, and which excited so much public interest. Either one of the former competitors ought to be recognised, or there should be a new competition. We may however point out to "H. W.," in view of the last paragraph of his letter, that there is no reason that we know of why a "basilica" should not also be a "design."—ED.

OBITUARY.

MR. ARTHUR CATES.—We regret to announce the death, in his seventy-third year, at his residenee, No. 12, York-terrace, Regent's Park, of Mr. Arthur Cates, formerly of No. 7, Whitehall-yard, S.W. Mr. Cates was born in London on April 29, 1829, and received his earlier education at King's College School, Strand. He then became a pupil of Sydney Smirke, R.A. He was elected an Associate member of the Royal Institute of British Architects in 1856, and a Fellow in 1874 ; he was for some while a member of the Council, and Vice-President during the period 1888-92 ; in 1847 he had been elected a member of the Architectural Association. He was also a Fellow of the Surveyors' Institution. In 1870 Mr. Cates succeeded Sir James Pennethorne in the appointment of Architect to the Land Revenues of the Crown, under the Commissioners of H.M. Woods and Forests. As Surveyor to the Honourable Society of the Inner Temple, he designed the archway and gate-house which form the entrance from Tudor-street into King's Bench-walk (1887). For some while he was honorary secretary to the Council of the Society of Biblical Archæology, and honorary secretary to the Architectural Publication Society, who brought out "The Dictionary of Architecture." He served as chairman of the Board of Examiners, R.I.B.A., and was appointed a member (being chairman) of the Tribunal of Appeal under the London Building Act, 1894 ; to that office he was re-appointed for a term of five years from January 1, 1900, under Sections 175-6 of the Act, by the Council of the Institute. In January last year Mr. Cates founded a prize, to be awarded by the Architectural Association, for a descriptive and illustrative account of the Paris Exhibition, 1900, in the form of a Paris Exhibition travelling studentship of 20*l.*, to a member of the Architectural Association ; the prize was awarded to Mr. E. W. M. Wonnacott. He also was founder of the "Arthur Cates Prizes," consisting of books to the value of ten guineas, for students admitted to the Final Examination. His warm and active interest in all matters relating to the professional education of architects is well known. We may here cite his article upon "Architectural Education in the United States of America," which appeared in Volume VI. of the Royal Institute of British Architects' Journal. In 1890 Mr. Cates was elected honorary treasurer to the Architects' Benevolent Society, an institution in which he took the warmest interest, and was re-elected in that capacity for 1895-6 ; in March last he was appointed a trustee of the society *vice* Mr. Henry Currey, deceased. In the course of the last professional year Mr. Cates was nominated by the Senate of the University of London as member of the Board of Studies for Fine Art, including architecture, as representative of the Institute ; his colleagues elected him chairman of the board. On April 14, 1900, we reported a paper upon "Ancient Lights," read by him at a special meeting of the Institute on April 9 of that year.

GENERAL BUILDING NEWS.

MALMESBURY ABBEY CHURCH.—A meeting of the Restoration Committee was held at the Town Hall, Chippenham, recently. The architect, Mr. Harold Brakspear, reported that the contractors had completed the repairs of the flying buttresses of the south side, with the exception of the double buttress at the west end, which they were unable to repair with safety until the south-east corner of the ruined aisle had been made good. As the restoration of the aisle, forming part of Section 2, is not comprised in the existing contracts, it was resolved that in order to give the required support to the buttress the reconstruction of such corner should now be effected instead of being carried out with the rest of the aisle at a later date.

REOPENING OF ABSON CHURCH, GLOUCESTERSHIRE.—The old parish Church of St. James, Abson, was reopened recently by the Bishop of Bristol after having been repaired. The work of restoration was carried out by Mr. Mark Gunning, of Holbrook, and Mr. Heming, of Wick, under the direction of Mr. Edmund Buckle, M.A., of London. The roof of the nave is completely new ; the floor has been covered with concrete, and laid with wooden blocks ; the old pews have been removed, and the oak of which they were made has been used as panelling round the church. The new seating has been provided by Messrs. Stephens & Bastow, of Bristol, and the church has also been furnished with a small organ from Messrs. Vowles.

IMPROVEMENTS TO PARISH CHURCH, ALFRETON.—A year or two ago it was decided to carry out certain work at the parish church. The proposal of the vicar was to lengthen and raise the height of the chancel, to build an organ-chamber on the south side of the chancel, and raise a choir vestry and a ringer's loft at the west end of the church. The scheme was estimated to cost between 1,100*l.* and 1,200*l.* Messrs. Fisher Bros., of Mansfield, were given the contract for the work, of which Mr. Hodgson Fowler, of Durham, is the architect, and it has now been completed.

NEW FISHERWICK PRESBYTERIAN CHURCH, BELFAST. — The new Fisherwick Presbyterian church was opened on the 28th ult. The new building, which has cost about 16,000*l.*, comprises chancel, nave, transepts, aisles, organ-chamber, choir, practice-room, vestry, and committee-chambers, and a small western gallery. The style is the Early Perpendicular, and the church is apsidal. Contiguous to the choir is a chamber on the north side of the chancel for the organ. The nave is divided into five bays and transepts, having lofty stone arches resting on pillars. Each bay is furnished with tracery windows and stained glass. The western end has a small gallery, under which is the porch and principal entrances. On the north-west side are the tower and spire, rising to a height of 138 ft. The length of the nave inside is 82 ft., and the length of the chancel 30 ft. The width of the nave inside is 45 ft., and of each of the side wings 12 ft. The roof is open-timbered, There are five east windows filled with stained glass. The church has been connected by telephone with the houses of several members of the congregation who are too infirm to attend the services. In addition to the church buildings proper there is a lecture hall, with schools and caretaker's residence. These are carried out in harmony with the style of the church. The stained glass was provided by Messrs. James B. Campbell & Co., and the mosaic pavement by Messrs. W. D Henderson & Sons. The heating, which is on the Plenum system, has been carried out by Messrs. Davidson & Co., Belfast. Messrs. Wm. Coates & Sons were responsible for the electric lighting and fittings, from particulars given by Mr. W. D. Ferguson, electrical engineer. The carved oak pulpit was made by Messrs. Purdy & Millard. Mr. Robert Corry, J.P., had charge of the building contract, and Mr. Samuel P. Close, whose designs were selected in competition, acted as architect.

BAPTIST CHURCH, EXMOUTH.—The new Baptist church, Exmouth, was opened on the 1st inst. The building, which is situate in the Victoria-road, has been erected from plans prepared by Mr. Philip Kerley, architect, of Exmouth, the builder being Mr. G. Hayman. The cost is about 1,150*l.* The dimensions of the chapel are about 50 ft. by 32 ft., and it has seating accommodation for 300 and choir. There are two entrance porches, a large organ-chamber, and two vestries. The rostrum is partly set in a bay-shaped recess. The whole of the floor-

ing is in wood-block, whilst heating has been provided for on the hot-water system. The elevation has been carried out in limestone, with Bath-stone dressings. A large tracery window in the centre gable is a chief feature of the front. Sufficient space has been left at the back of the church buildings for the erection at a later date of schoolroom and classrooms.

RE-OPENING OF MACHEN CHURCH, MONMOUTHSHIRE.—This church was re-opened recently after restoration. The work was carried out under the direction of Mr. C. B. Fowler, of Cardiff, and has included the provision of nearly new roofs. The old ceiling has been removed, and a wooden ceiling substituted with moulded ribs. The old west gallery was removed, and new pews, pulpit, and desk fixed, whilst a portion of the walls was rebuilt. The plaster has been taken off the interior and exterior walls and the masonry pointed. The square tower has also been restored, and a new ringing floor provided. According to the *South Wales Daily News*, during the progress of this work several finds of interest were made. Chief of these were rood loft steps and entrances, three niches, an old piscina, a west window opening, the remains of a rood screen, and a priest's doorway in the chancel.

WESLEYAN CHURCH, SUNDERLAND.—The foundation stone was laid on the 8th inst. of the Wesleyan Church and schools which are to be erected on the Holly House site, at the junction of the Durham and Tunstall-road, Sunderland. The church will be cruciform on plan and be entered by vestibules at the junction of the two roads. At either side of the main entrance will be the staircases leading to the gallery, and there is to be a separate entrance to each transept. At the rear of the church the minister's and choir vestries will be situated, with direct access to the pulpit and choir stalls, the organ being placed in a recess behind the pulpit. The accommodation will be for 800 worshippers. The seats, pulpit, choir stalls, &c., will be in pitch pine, while the windows will be glazed throughout with cathedral lead lights. Behind the church is to be a spacious schoolroom with gallery running round, off which eight classrooms open. There will be also a large school for infants, together with numerous society classrooms, ladies' parlour, kitchens, lavatories, and cloakrooms, &c. The buildings will be faced externally with stone. The lighting throughout will be by electricity. At the left-hand side of the main entrance to the church and at the junction of the roads, will be a tower and spire, rising to a height of 100 ft. The building has been designed by and is being erected under the superintendence of Mr. J. Jameson Green, architect, of Liverpool. The builder is Mr. John Stott, of Sunderland, and the clerk of the works is Mr. W. A. Lowry, of Liverpool.

CATHOLIC CHURCH, DUMBARTON.—The foundation-stone has just been laid of the new edifice for St. Patrick's congregation, Dumbarton. The building now in course of construction, which is situated in Strathleven-place, has been designed by Messrs. Maule & Hanson, of Newcastle, and is estimated to cost 12,000*l.* and seat 1,200 people. It is in the Early English style, and is being built of red sandstone from Dumfries.

ST. PATRICK'S NEW CHURCH, BROOMFIELD, CO. MONAGHAN.—This church is now practically finished. The dedication has been fixed for September 15 next. Mr. G. L. O'Connor, Dublin, is the architect, and Mr. Wynn, Dundalk, the builder.

BAPTIST CHURCH, EAST HAM.—A Baptist church has been erected in Plashet-grove, East Ham, from designs by Mr. Edgar Stones. Messrs. Holliday & Greenwood were the builders. The cost has been about 9,000*l.*

CHURCH OF THE ASSUMPTION, AGHADOWEY, COLERAINE.—The building of this church has just been completed. The church measures 98 ft. by 32 ft., and is built of local bluestone, with dressings of Dungannon freestone. Mr. J. John O'Shea was the architect. The builders were Messrs. M'Nally & Son, Cookstown.

CONGREGATIONAL CHURCH AND SCHOOLS, WALLSEND.—The memorial stone has just been laid of a Congregational church and schools at Wallsend. Mr. J. Walton Taylor, of Newcastle, is the architect.

BOARD SCHOOLS, INGROW, YORKSHIRE.—New schools erected at Ingrow by the Keighley School Board, at a cost of 16,300*l.*, have just been opened. The schools abut on the west on the new Queen's-road, which runs from Victoria-road to Ingrow-lane. The infants' school, which is the one nearest Ingrow Church, and is erected on the central hall principle, will accommodate 290 children, and the building is so arranged that three classrooms, giving additional accommodation for 180 children, can be erected at the south end at comparatively little outlay. The central hall here is 48 ft. by 30 ft., and the five classrooms each about 24 ft. by 22 ft. The entrance is on the ground floor. The mixed school is reached by a covered stone stairway, and here accommodation is furnished for 486 scholars. There are seven classrooms, on an average 26 ft. by 24 ft., and a central hall, 60 ft. by 30 ft. On the upper floor of the mixed school, and reached by a stone stairway from the east entrance, is a classroom for cookery, 30 ft. by 25 ft., having a large cooking range, sinks, and provision for gas cooking-stoves, &c. There are separate entrances, cloakrooms, and lavatories for each sex; in each school there are retiring-rooms for the headmaster, headmistress, and assistants. Block flooring has been adopted almost throughout. The warming and ventilation is on the Leicester Plenum system. A tower is erected between the two schools for the fresh air supply. The whole of the ventilating and warming apparatus has been supplied and fitted up by Messrs. Ashwell & Nesbit, Limited, London. There are two large covered playgrounds, one under the mixed school, above the open playground level, for girls and infants, and one behind the mixed school for boys. At the back portion of the girls' playground is a laundry and washhouse, 46 ft. by 24 ft.; and over the boys' covered playground is a manual training room, 42 ft. by 25 ft. The area of the site, inclusive of the part reserved for the future senior school, on the west, is 12,000 square yards; and the total cost of the site and works and fencing is 16,300*l.* The following firms have been engaged upon the works:—Mr. Michael Sunderland, mason, Keighley; Messrs. Foster & Fortune, joiners, Keighley; Messrs. Hiram Emmott & Co., plasterers, Keighley; Mr. William Thornton, slater, Bingley; Mr. Samuel Rushworth, plumber, Shipley; Messrs. Holmes & Sons, painters, Steeton. The wrought-iron gates and railings are by Messrs. Longbottom Bros., Bingley; gas and cloakroom fittings by Messrs. Longfield & Co., Otley; block flooring by Mr. Roger Lowe, Farnworth; desks, &c., by Messrs. Illingworth, Ingham, & Co., Leeds. The architect was Mr. Wilson Bailey, Bradford and Keighley; and the clerk of works Mr. James Bottomley, of Haworth.

PROPOSED TOWN HALL, CHELTENHAM. — The Cheltenham Town Council having proposed to erect a town hall on land near the Winter Garden, a Local Government Board inquiry into an application for sanction to borrow 35,000*l.* for the carrying out of the scheme was held recently by Colonel Marsh, R.E. The architect is Mr. Waller. The scheme has met with considerable opposition from the townspeople, who allege that the site is unsuitable.

SCHOOL, PLYMOUTH.—The Plymouth School Board propose to erect new schools in Salisbury-road. The architect is Mr. H. J. Snell.

WORKING MEN'S HOME FOR WISHAW, NEAR EDINBURGH.—A company has been formed in Wishaw for the purpose of erecting a working men's home in the district of Craigneuk. The capital is 4,000*l.* Plans will be immediately prepared by Mr. Cullen, architect, Motherwell, and the home will provide 150 beds.

SAILORS' HOME, CHATHAM.—The foundation-stone was laid recently of the Sailors' Home, adjoining St. Mary's National Schools, and close to the Town Hall, Chatham. It is intended to construct buildings covering an area of 165 ft. by 245 ft., and including a central hall 100 ft. by 48 ft., billiard and retiring rooms, and some 600 cubicles. The building now in hand is only a sixth part of the whole scheme. It has a frontage of 88 ft. to the Upper Drawbridge-road, and a depth of 50 ft. It is set back 50 ft. from the road, and it will ultimately have a lawn in front and be approached by two carriage drives. The building will be constructed of stock bricks with stone and red brick dressings. It is to be four stories high, and provision is made in the basement for a kitchen, bathrooms, pantries, scullery, beer cellar, and various stores and offices. On the ground floor there are separate rooms for petty-officers and men, with buffet and manager's offices. The first and second floors, overlooking the Drawbridge-road, will contain fifty-two cubicles, each 8 ft. by 5 ft. 6 in. The building is to be heated by hot water. The architect is Mr. G. E. Bond, and the builder Mr. H. E. Phillips, of New Brompton; the contract price being 5,195*l.*

SCHOOL BUILDINGS, ELY, GLAMORGANSHIRE.—At a meeting of the Cardiff Board of Guardians' School Committee recently, a scheme for the extension of Ely Schools was considered. The sub-committee appointed to confer with the architect and to suggest to the committee what buildings they considered were the most suitable for and in connexion with grouped homes at Ely reported that they had instructed the architect to prepare plans for the schools visiting committee. The plans were submitted and explained by the architect, Mr. Seward. They include an administrative block containing superintendent's house, office, grocery store, and sewing-room, to include clothing and drapery stores, one large cottage for twenty-four children, and four ordinary cottages for twelve children each, being accommodation for seventy-two children altogether. The architect's estimate of the cost of these buildings is 5,074*l.*, in addition to 400*l.* for draining and laying out the site, and 450*l.* for the dividing wall between the adults and children. The old hospital, which is no longer used for children, must, the committee suggested, be removed, but the new hospital will be available without any alteration.

NEW BUILDINGS IN ABERDEEN.—The Plans Committee of the Aberdeen Town Council has sanctioned the plans of the following new buildings:—Two dwelling-houses on the south side of Hamilton-place, for Mr. John Henderson, builder; dwelling-house on the east side of Albury-place, for Mr. Lewis Ross, per Messrs. D. & J. R. M'Millan, architects; dwelling-house on the north side of Rubislaw Den South, for Mr. C. J. Davidson, per Messrs. W. & J. Smith & Kelly, architects; two dwelling-houses on the south side of Carlton-place, for Mr. John Rae, per Mr. William Smith, architect; workshop on the east side of Berryden-road, for the Northern Co-operative Company, Limited, per Mr. J. Wallace, joiner; stable and coach-house at the rear of No. 3, Osborne-place, for Mr. William Peters, per Mr. John Stephen, Mile End-place; alterations in connexion with workshops on the east side of Union Wynd, for Messrs. John Alexander & Co.; additions to No. 9, Queen's-road, for Mr. Alexander Gray, per Messrs. Brown & Watt, architects; alterations and additions in connexion with premises, No. 45, Causewayend, for Mr. John Coutts, per Mr. A. Winchester, builder; two dwelling-houses on the west side of King-street, for Mr. George Godsman, per Mr. John Cameron, architect (amended plan); additions to Walker-road Public School, for the Aberdeen School Board, per Mr. J. A. O. Allan, architect (amended plan); alterations in connexion with the premises, Nos. 52-54, Union-street, for Messrs. William Walker & Sons, per Mr. John Rust, architect; additions to Migvie House, North Silver-street, for Mr. W. Kendall-Burnett, per Messrs. W. and J. Smith & Kelly, architects; alterations in connexion with offices, No. 15, Dee-street, for Messrs. Lumsden & Davidson, per Messrs. W. and J. Smith & Kelly, architects; two dwelling-houses on the south side of Murray-terrace, for Mr. J. Kynoch, engineer, and Mr. George Moir, per Mr. George Sutherland, architect; shed in connexion with the Aberdeen Royal Infirmary, Woolmanhill, per Messrs. W. and J. Smith & Kelly, architects; piggeries at Ashgrove-road, for the directors of the Royal Lunatic Asylum, per Mr. George Taylor, master of works.

ALMSHOUSES, DROITWICH.—Five new almshouses in connexion with the Coventry Charity and a new infirmary were opened at Droitwich by the Countess of Coventry on the 1st inst. The new buildings are of red brick with stone facings. Mr. Lewis Sheppard, of Worcester, was the architect, and Messrs. Emuss & Harris, Droitwich, the builders.

CATHOLIC SCHOOL-CHAPEL, WORSBRO', YORKSHIRE.—A Catholic school-chapel is being erected at the corner of Henry-street, Worsbro', at an estimated cost of about 1,000*l.* It will be a brick building, having a frontage of 40 ft. to the Barnsley and Sheffield highway, and extending back along Henry-street a distance of 70 ft. The total accommodation will be for about 150 persons, the main room measuring 70 ft. by 30 ft. This will be divisible into two portions by means of a sliding partition. One portion will be used during the week as a school; the other will be exclusively set apart for church purposes. Cloakrooms, lavatories, &c., will be attached to the school premises. Connected with the chapel there will be a vestry or sacristy. Mr. J. F. Brown, of Barnsley, has been entrusted with the builders' work, and the other contracts have also been let to Barnsley firms, viz., joiners' work, Mr. G. Robinson; slating and plastering, Miss Fleming; painting, Mr. H. Cheshire; plumbing and glazing, J. Snowdon & Sons. The architect is Mr. Edward Simpson, of Bradford.

THE DICK INSTITUTE, KILMARNOCK.—The Dick Institute, erected at Elmbank, Kilmarnock—the gift of Mr. James Dick, Glasgow—for the accommodation of the Public Free Library and Museum, including the collections presented to the town by the late Mr. James Thomson, F.G.S., and Dr. Hunter Selkirk, of Braidwood, was opened on the 30th ult. The front portion of the building is two stories in height, and the return wings are one story, the frontage being 138 ft. in length, with a total depth of 114 ft. The leading feature is the portico which forms the main entrance. The pediment terminates with a figure of Minerva, with a sphinx on either side, and in the tympanum the Kilmarnock arms, with supporters. The principal entrance is by the portico and vestibule leading to an entrance-hall. To the right and left are the reading-room and library, and behind the main staircase is a lecture-hall capable of accommodating nearly 500 people. On the second floor there is a large upper hall and vestibule with dome. To the right is the north museum, which has a floor space of 1,750 sq. ft., and on the left is the south museum, with a floor area of 2,000 sq. ft. The museums are lighted both from the walls and the roof. The architect was Mr. R. S. Ingram, and the builder ex-Bailie Calderwood.

PROPOSED COUNTY COUNCIL OFFICES, NEWPORT.—Colonel Ducat, R.E., held a Local Government Board inquiry at the Monmouthshire County Council offices, Newport, on the 3rd inst., with reference to an application by the County Council to borrow 10,000*l.* for the erection of a Council Chamber and an extension of the present offices at Pentonville, Newport. Mr. Tanner, the County Surveyor, was in attendance.

WORKMEN'S DWELLINGS, EBBW VALE, WALES.—The Ebbw Vale Urban District Council has decided to erect forty workmen's houses, twenty of which will be commenced as soon as a loan for the purpose has been sanctioned by the Local Government Board and negotiated. Mr. T. J. Thomas, the Council's Engineer and Surveyor, prepared three designs for the approval of his authority. On the ground floor a parlour, kitchen, scullery, and larder

are provided; on the first floor one bedroom, the entire width of the front of the house, lighted by two windows, a lesser bedroom in the main building, and another immediately over the scullery. The dimensions are:—Parlour, 11 ft. 6 in. by 9 ft. 6 in.; kitchen, 13 ft. by 11 ft. 6 in.; scullery, 9 ft. by 8 ft.; larder, 8 ft. by 4 ft.; first floor—bedrooms, 15 ft. by 9 ft. 6 in., 13 ft. by 9 ft., and 13 ft. by 8 ft. In the scullery a fireplace, boiler, and bath are shown, the latter to be supplied from the boiler when required. This part of the building, which is a wing at the rear, can be entered from the back, so that a workman can bathe and change before entering the living rooms at all. The scullery opens into the kitchen, and behind the door is the bath.

NEW BAKERY, ABERDARE CO-OPERATIVE SOCIETY.—A new bakery has been erected at the Gadlys on a plot of freehold ground bought by this Society. The block of buildings is 180 ft. long by 20 ft. wide, and two floors in height. It is built of Nantmelyn white pressed bricks, with red Cattybrook brick dressings to the doors, windows, &c. On the ground floor is a bakery 17 ft. by 20 ft., with cooling-room 13 ft. by 20 ft., both lined with white glazed bricks, fitted up with two pairs of Messrs. Masons' double-decker ovens, dough-mixing machinery, hoist, &c., with stoking 7 ft. 6 in. by 20 ft. in the rear. Attached to the bakery by a covered way are an office and engine-room, with one of Crossley's 8 h.-p. gas-engines. The cooling-room opens out by means of sliding doors into the large coach-house 38 ft. by 20 ft. The stable block at the south-west comprises eight stalls and horsebox and harness-room. The cart-house and stable are paved with Staffordshire blue brick. On the first floor are two flour stores, each 40 ft. by 20 ft., with hoist from coach-house. Over the stable is a hay and corn loft 73 ft. by 15 ft. The premises have been built by Messrs. John Morgan & Sons, contractors, from the designs and under the supervision of Mr. I. Ll. Smith, architect, Aberdare, at a cost of 3,000*l.*

SANITARY AND ENGINEERING NEWS.

HARBOUR WORKS, FINDOCHTY, BANFFSHIRE.—The harbour at Findochty is to be deepened and a pier constructed at Sterlochy. The Harbour Commissioners have accepted the tender of Messrs. John Adam & Co., of Glasgow, the amount being 4,305*l.* The work will be carried out according to plans by Mr. D. J. Reid, C.E, of Inverness.

WATERWORKS EXTENSION, ST. HELENS, LANCASHIRE.—A Local Government Board inquiry was held on the 10th inst. at St. Helens by Mr. H. P. Boulnois, in reference to the application by the Corporation of the Borough for permission to borrow 5,000*l.* for waterworks purposes. Mr. J. J. Lackland, Borough Water Engineer, explained the details of the undertaking.

FOREIGN.

FRANCE.—Five new rooms are shortly to be opened at the Louvre, for the exhibition of the tapestries, furniture, bronzes, and other objects forming the collection of the Garde Meuble National.——A large composition by M. Dagnan-Bouveret, representing "Apollo and the Muses," has been placed in Richelieu theatre in the New Sorbonne.——Various private art exhibitions of interest are now open. At the Durand-Ruel gallery, a collection of Breton landscapes by M. Henry Moret; landscapes by M. Guillaume at the Bertheim gallery; and at Messrs. Tooth's gallery the "monotype" paintings on copper by M. Gaston Guignard.——M. Patey, the medallist, has completed his model for the medal commemorative of the founding of Marseilles. The obverse presents the ancient legend of the city, the reverse a view of Marseilles, with the date at the base, encircled by a garland.

GERMANY.—The castle of the Emperor Charles IV., at Tangermünde, is about to be restored, by command of the German Emperor; Herr Möbius, the well-known architect, has been charged by his Majesty to prepare plans for the work.——Designs are invited by Messrs. Seemann & Co., of Leipzig, for a façade to a large building; the competition is open to all architects who speak the German language, and five awards will be made. The designs have to be sent in by the 31st inst., and full particulars may be obtained from Messrs. Seemann & Co.

UNITED STATES.—The President has appointed a Commission to prepare plans for the future development of the city of Washington, composed as follows:—Mr. F. L. Olmsted, of Brooklyn, Mass., who was the architect of the park system of the city; Mr. D. H. Burnham, of Chicago, the architect-in-chief of the recent Chicago Exposition; and these two gentlemen have been authorised to nominate a third person, to act as the remaining member of the Commission.——The great waste of water in Boston is attracting considerable attention; during 1900 water to the amount of 115½ gallons was used per head per day, as compared with 111 gallons in 1899 and 103 gallons in 1898. To abate this waste the compulsory use of meters is under consideration, though much is probably due to leakage from the mains.——It is proposed to erect a monument in Detroit in honour of General Alexander Macomb, and the design of a Washington sculptor, Mr. Amateis, has been accepted.——Considerable agitation has been made in San Francisco for some time with a view to getting the city supervisors to modify the ordinance which limits the height of fireproof buildings to 120 ft. Several builders have petitioned that the maximum height be increased to 170 ft., and that the limit for a six-story building should be raised from 80 ft. to 100 ft.——The Randolph (Virginia) County Commissioners have decided to erect a courthouse at a cost of about 75,000 dols.——The State of Washington has authorised the purchase of the county courthouse at Olympia, for use as the State capitol, and additions estimated to cost 175,000 dols. will be immediately proceeded with.——The designs for the Westmoreland County Courthouse at Greensburg, Pennsylvania, have been completed by the architect, Mr. W. Kauffmann, of Pittsburg; the estimated cost of the building is 700,000 dols.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. W. Scorer and Mr. H. G. Gamble, architects, of Lincoln, have entered into partnership.

THE STUDENT'S COLUMN.—Owing to pressure of other matter our Student's Column article ("Sanitary Fittings and Plumbing") is held over until next week.

THE SANITARY INSTITUTE.—At an examination in practical sanitary science, held in London, on April 26 and 27, twelve candidates presented themselves, and the following five candidates were awarded certificates:—F. Elgar, G. B. Grave, Kenneth Gray, Percy B. Sands, and Robert Wood.

PUBLIC CREMATORIA.—The Standing Committee of Law of the House of Commons have ordered to be reported with amendments to the House the Cremation Bill, which is in charge of Lord Monkswell and Sir W. Foster. The amendments provide that every public crematorium established by a Burial Authority shall, before it is used, be duly certified by that Authority to the Home Secretary as being complete and properly equipped; that the Secretary of State shall make regulations for the registration of cremations as well as in respect of cremation in general; and that the regulations shall be laid during forty days before both Houses of Parliament. The Bill enacts that in all cases the approval of the plans of proposed crematoria must, in the first instance, be obtained from the Local Government Board.

DERWENTWATER.—The National Trust for Places of Natural Beauty or Historical Interest appeal for contributions towards a sum of 7,000*l.* to enable them to acquire, on behalf of the public, a portion of the shore of the lake. The property which they seek to purchase covers 108 acres, known as Brandlehow Park, situated on the west side of the lake, below the Catbels slopes, and near Otterbield Bay towards the north. At present the shores of the lake belong to private owners, and there is no general access to them, the landing-places excepted. The proposed purchase would give the public access to about one-sixth of the water-side, and prevent the land from being taken for other purposes, or, at least, from being disfigured with sign-boards and advertisements.

STREET IMPROVEMENTS, HAMMERSMITH.—The Hammersmith Borough Council recently passed the usual statutory resolution for putting into operation Michael Angelo Taylor's Act, for carrying out a large street improvement at the eastern end of the Borough, in the vicinity of Blythe-road. The scheme provides for the acquisition of the whole of the site of the Swan laundry, so that Augustine-road may be continued into Blythe-road; for the removal of the triangular projection now existing at the point of junction of Blythe-road and Dewhurst-road; and for the widening of Blythe-road to 40 ft. on the south side, leaving a valuable area for the purpose of recoupment.

BRITISH FIRE PREVENTION COMMITTEE.—The Executive of the British Fire Prevention Committee announce that the opening of their new testing station at Westbourne Lodge, Bayswater, which had to be postponed on account of the illness of their Chairman, Mr. Edwin O. Sachs, will now take place on Wednesday afternoon, the 22nd inst., when testing operations will be resumed and the issue of the Committee's reports, which have already reached an aggregate of sixty, will again be regularly proceeded with.

CAPITAL AND LABOUR.

YORK BRICKLAYERS' STRIKE.—Members of the York Branch of the Bricklayers' Operative Society, to the number of over 200, gave an hour's notice at eleven on Saturday morning last to the employers, and left at noon, taking their tools. The difference is one respecting working rules hitherto existing between masters and men.

PENRHYN QUARRIES.—Arrangements are being made for reopening the above and giving police protection to men who work, but it is not anticipated that more than a few hundred will resume work

LEGAL.

THE NEW STREET FROM HOLBORN TO THE STRAND.

THE case of the London County Council *v.* the Metropolitan Electric Supply Company, Limited, came before the Court of Appeal, composed of Lords Justices Collins and Stirling, on Thursday, the 8th inst., on the appeal of the defendant company from an order of Mr. Justice Farwell, dated April 25 last. The case was reported in the *Builder* of May 4, 1901.

The case raised a question of interpretation of a Section of the London County Council (Improvement) Act, 1899. When the Act was passed the defendant company had a generating station and works for the purpose of electric lighting in Sardinia-street, the whole of which was required to be taken by the County Council for the purposes of the new street from Holborn to the Strand. A statutory bargain was arrived at between the parties which was embodied in Section 58 of the Improvement Act. The dispute arose under Sub-Section 7, which provided in effect that the Council before the date of conveyance and lease of the new site (which the Council had to provide for the company) should pay or secure to the satisfaction of the company a sum equal to the costs of erecting and fitting-up a new generating station upon the new site with new plant of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts. The plaintiffs contended that this meant that they were only bound to provide a sum equal to the costs and expenses of erecting and fitting up a new generating station, with new plant, of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts, and that they were not bound to bear the expense of a new plant of a capacity to generate and supply electrical energy to an output of 5,000 kilowatts or any number more than 4,000 kilowatts, on the ground that, under unusual circumstances, a more powerful plant might be required to generate and supply 4,000 kilowatts. The defendants, on the other hand, contended that the sum claimed by them was based on the station and plant being of a capacity to generate and supply such output as a matter of practical commercial working, and that it was impossible for them to generate and supply an output of not less than a fixed amount without having in addition to the minimum plant capable of generating or supplying such an amount temporarily spare or extra plant in case of a breakdown or repairs. Mr. Justice Farwell held that the plaintiffs were right in their contention, and granted a declaration to that effect—hence the present appeal of the defendants.

Mr. Cripps, K.C., Mr. Butcher, K.C., and Mr. Sargent appeared for the appellants; and Mr. Haldane, K.C., Mr. C. E. Jenkins, K.C., and Mr. Methold for the respondents.

At the conclusion of the arguments of counsel, Lord Justice Collins, in giving judgment, said it was obvious that in order to ascertain what sum was to be paid by the County Council, they must have a decision by competent persons on questions of fact. It was substantially agreed that the matter must go to an arbitrator as to some part of the matters in dispute, and it had been thought desirable to anticipate the arbitration by taking the opinion of the learned judge as to the construction of a point of law arising upon the section in question. The short point of law which the learned judge had to decide was whether, as a matter of law, the arbitrator was to be debarred from allowing, and therefore calling upon the defendants to pay for anything more than for such engines which could fairly be graded up to 4,000 kilowatts. It seemed to him that if he were sitting as a judge bound to disengage the question of law from that of fact he should come to the conclusion that on the section in question the proper direction would be that the sum to be paid would be for such plant as would be required to generate for a reasonable period under all conditions such as might reasonably be anticipated an energy of not less than 4,000 kilowatts. Dealing simply with the matter as a judge directing a jury, he could not lay down as a matter of law that nothing more than four machines of a capacity of 1,000 kilowatts would be required to accomplish that purpose, nor on the other hand could he lay down that anything more would be required. That would be for experts to determine, and if they said that four such engines were not competent in an ordinary commercial sense to carry out the obligation imposed upon the defendants of continually supplying an output of 4,000 kilowatts then the County Council must find the money and pay for anything more that was required. He thought that the appeal must be allowed.

Lord Justice Stirling concurred and the appeal was accordingly allowed.

ACTION FOR LIBEL BY ASPHALTERS AND TAR-PAVIORS.

THE hearing of the case of Grounds and Another *v.* Hickman and Another concluded in the King's Bench Division on the 9th inst., before Mr. Justice Channell and a common jury, an action brought by the plaintiffs, Messrs. Grounds & Newton, a firm of asphalters and tar-paviors, to recover from the

defendants, Messrs. Hickman & Leatherdale, the proprietors of the *Woodford Mail* and the *Wanstead Mail*, damages for alleged libel.

It appeared that the plaintiffs contracted for some years to do the tar-paving and other work for the Woodford Urban District Council, and that in August, 1900, the defendants published in the two newspapers in question reports of a speech delivered by a Mr. John Knight at a meeting of the Council, and added the following paragraph: "Mr. John Knight made some very forcible criticisms on Monday evening at the Woodford Council meeting on what he fitly described as the 'slovenly manner in which the tar-paving contract work of the parish has been carried out.' He proposed that no further tar-paving be done under the present contract except such as shall be approved after view by the Highway's Committee, and his motion was carried. This is good news. Mr. Knight is an authority on paving work, and we are pleased he has soon given the parish the benefit of the open expression of his opinion that the ratepayers' money is being wasted when contracts are given to incompetent firms."

The plaintiffs' case was that these words referred to them, and were defamatory to them. The defendants denied that the paragraph in question referred to the plaintiffs, but alternatively pleaded that if it could be so construed it was fair comment on a matter of public interest. In another issue of their papers the defendants published the following:—"Messrs. Grounds & Newton, the present contractors for tar paving to the Woodford Council, having taken exception to a paragraph in the *Mail* stating that the ratepayers' money must not be wasted on incompetent firms, we hasten to make clear to our readers that Messrs. Grounds & Newton's firm was not one of the 'incompetent firms' therein referred to. The paragraph in question was written in a general sense, and was only intended to emphasise the necessity of laying out the public money to the best possible advantage."

In the result the jury awarded the plaintiffs 25*l.* damages.

Judgment accordingly.

Mr. F. Dodd appeared as counsel for the plaintiffs, and Mr. M. O'Connor and Mr. Campbell Macrae for the defendants.

AN IMPORTANT BUILDING CASE:

BUILDING OWNERS INTENTION TO APPEAL.

THE Hon. Alfred Lyttelton, K.C., on the 13th inst., applied on behalf of the defendants in *re* an arbitration between Ford & Co. and Bemrose & Sons, Limited, to the Court of Appeal, composed of Lords Justices Collins and Stirling, for a stay of execution pending an appeal by the defendants from the decision of a Divisional Court of King's Bench consisting of Justices Kennedy and Phillimore on the 1st inst. (Reported in the *Builder* of May 4 last.) The learned counsel stated that the arbitrator (Mr. Robert Vigers) had stated his award in the form of a special case for the opinion of the Divisional Court to be had on certain points of law. The decision of the Divisional Court made that award final. From this decision the defendants wished to appeal to their lordships. The plaintiffs were builders and the defendants were the building owners. A contract was entered into in May, 1895, between the parties, by which the plaintiffs agreed to build certain large premises at Derby. The plaintiffs tendered for the work on a bill of quantities for a lump sum of 10,599*l.* There was the usual provision in the contract for certificates by the architect for extras. The buildings were erected, and the architect in 1897 gave his final certificate certifying that there was a balance owing to Messrs. Ford of 1,530*l.* odd. Messrs. Ford refused that sum on the ground that it was insufficient, and then they put into force the arbitration clause in the contract. The arbitration took place, and the award was the result. The whole point between the parties was this: Messrs. Bemrose & Sons said that the contract was for a lump sum plus the certificated extras. Messrs. Ford said the contract was for 10,599*l.*, but inasmuch as the quantities upon which they tendered, and which were presented to them by Messrs. Bemrose's architect, turned out to be insufficient, they were entitled to be made good that insufficiency to the extent of about 3,000*l.* The arbitrator found that as the quantities were incorrect, it was the custom of the building trade that the deficiency should be made good, and in respect of that deficiency nearly 3,000*l.* had been found against the building owners. Messrs. Bemrose admitted, of course, that there was a very substantial point of law to be decided, and all they desired was a stay of execution pending the appeal being heard. His clients were willing to secure to the plaintiffs the full fruits of their judgment and to pay them the sum found against defendants upon the architect's certificate. They were also willing to pay the costs on the plaintiffs' solicitors undertaking to return them if the appeal should prove successful, and to pay the balance in dispute into Court to abide the judgment of the Court of Appeal.

Mr. Joseph Walton, K.C., for Messrs. Ford & Co., said he could not accede to the application. His clients had been kept out of their money for four years. If 5,000*l.* was due to them they had lost about 1,000*l.* as interest, and if the smaller sum, only about 400*l.* in interest. There was no suggestion that the plaintiffs were not perfectly solvent people quite able to pay the money back if the appeal of Messrs. Bemrose were successful. They were builders in a large way of business, and it was obviously a great disadvantage to them to have their money locked up in this way.

Mr. Lyttelton said that four years ago his clients tendered to Messrs. Ford 1,500*l.*

Mr. Walton: In full discharge; not on account. Now after a long argument we have got the judgment of the Divisional Court in our favour. The Divisional Court refused a stay, and I submit there is no ground for disturbing the decision of the Divisional Court.

In the result Lord Justice Collins said it seemed to him there was a substantial point of law to be argued on the appeal, and he thought that a stay of execution ought to be granted until the hearing of the appeal, on the defendants paying 2,300*l.* into court and the taxed costs to the plaintiffs' solicitor on his undertaking.

Lord Justice Stirling concurred.

EMPLOYERS' LIABILITY ACT AND THE WORKMEN'S COMPENSATION ACT.

RESULT OF PROCEEDING UNDER THE WRONG ONE.

THE case Davies *v.* Nash (reported in these columns a few weeks ago) came again before Judge Stonor on Tuesday at Marylebone County Court. Mr. T. Davies, a plasterer, Kensal-terrace, Kensal-green, was the plaintiff, and he sought, under the Employers' Liability Act, to recover damages from Mr. David Henry Nash, builder, Fernhead-road, Paddington, the claim being in respect of personal injuries sustained by the plaintiff, owing (it was contended) to negligence, for which the defendant was responsible, in the construction of a ceiling scaffold.

At the previous hearing the jury found that there was no defect in the scaffold, and that the defendant was not guilty of negligence which caused the accident. Judgment was accordingly given for the defendant, but his Honour suggested that the plaintiff might have a claim under the Workmen's Compensation Act.

Mr. A. H. D. Nonweiler, solicitor, appearing for the defendant, now intimated that on behalf of his client he consented to the plaintiff receiving 10*l.*, which was all that he could claim under the Workmen's Compensation Act. He (Mr. Nonweiler), however, applied on behalf of the defendant for costs in the action under the Employers' Liability Act. The case had been adjourned at the request of the other side, with a view to joining another builder to the action, but six months having elapsed before notice was given to the second builder, the latter could not be made a party to the action.

Ultimately his Honour gave judgment for the plaintiff for the 10*l*, and allowed the defendant the costs of the previous action.

It was mentioned that the defendant's costs amounted to considerably more than the compensation awarded the applicant.

SLATE MERCHANTS AND BUILDERS.

AT the Southwark County Court, on the 8th inst., his Honour, Judge Addison, K.C., heard a remitted action, in which Messrs. Roberts, Adlard, & Co., slate merchants, of Dockhead, Bermondsey, sued Messrs. Nightingale, builders, to recover 24*l.* 5s. 8d. balance of account for slating supplied and work done. The defendants admitted the claim, but counter-claimed in regard to five items.

Mr. Bankes was counsel for the plaintiffs, and Mr. Duckworth for the defendants.

The case on the counter-claim was opened by Mr. Duckworth. He said the action was originally brought for 250*l.* odd, but his clients made a payment of 220*l.*, leaving 31*l.* 4s. 2d. On the day the writ was issued a further sum of 6*l.* 18s. 6d. was paid, thus reducing the claim to 24*l.* 5s. 8d. The defendants tendered on a bill of quantities for a contract for the baths in Lattimer-road, Wimbledon, for the Wimbledon Corporation, and they entered into a sub-contract with the plaintiffs for the roofing and the supply and fixing of some slate slabs to form slipper baths. The order was given as far back as December 28, 1899, and there was a provision that certain large thick slabs were to be supplied whole. This was found to be almost impossible, and the architect allowed the slabs to be delivered in two pieces, with a perpendicular rebated joint. There was considerable delay on the part of the plaintiffs in accepting the order for the roofing, it not being booked until March, but the defendants held that that for the slabs was entered in December. The roofing, however, was proceeded with and was finished within reasonable time, but the slabs were not supplied and fixed until the following September and October, and the defendants contended that this was an unreasonable time to take for such work. The first item in the counter-claim was in regard to a fine edge on the rebate, for which 10*l.* 17s. 11d. was charged. The defendants contended that this fine edge was included in the price paid for the rebate, as per schedule.

Mr. J. J. Greenwood, a member of the firm of Williams & Co., slate merchants, was called by the defendants. He said his firm would charge 3d. for a rebate, which would include a fine edge. The price of 2d. charged by the plaintiffs for the rebate ought to include a fine edge. In his opinion, three months was a reasonable period in which to carry out such slab work as in that case. Seven and a-half months was an unreasonable period to take for such work.

Cross-examined: There was a distinction between sawn edges and rebates. A rebate was not complete without it was rubbed, but a sawn edge could either be rubbed or left rough, according to the order. An extra charge would be made for rubbing a sawn edge.

Mr. David, one of the plaintiff firm, said that when the defendants wrote that they would be ready shortly for the slates, he put the matter in hand, and delivery took place soon afterwards. His firm did not delay the matter. As to the chases, it was no part of a slate-mason's duty to make them. The quotation stated that a penny would be charged for rubbing exposed edges, which were edges that could easily be seen or felt. The edges of the rebates were exposed edges, and therefore came within the specification. There were three edges to the rebates, and they charged threepence.

Cross-examined: He charged only for the edges on the exposed rebates which were on the doors. The edges of the rebates where the slabs were joined had not been charged for.

The case occupied nearly a whole day, and his Honour, in giving judgment, said he had heard it because he knew from experience of the enormous expense which would have been incurred had he referred it. He would not go into the matter in detail in giving judgment, except to say that the fine edge was necessary, and the plaintiffs were justified in charging for it as they did. On the whole he gave judgment for the plaintiffs on the claim and counter-claim, with costs.

Judgment was entered accordingly

THE ACTION AGAINST A DISTRICT COUNCIL FOR NUISANCE.

THE case of Hawkes *v.* the Leyton Urban District Council came before Mr. Justice Buckley in the Chancery Division on the 14th inst., on the application of the defendants for a modification of the order of sequestration granted against them by his lordship and confirmed by the Court of Appeal. The case was reported in the issue of the *Builder* of May 11. Mr. Justice Buckley ordered that the writ of sequestration should issue against the defendants for disobeying an injunction granted in April last year restraining the defendants, at the suit of the plaintiff, a resident at Leyton, from carrying on their works in connexion with electric lighting in such a way as to cause a nuisance by noise and vibration. On two occasions the operation of the injunction was suspended on undertakings given by the Council, on whose behalf it was stated that they were erecting steam plant which would be no nuisance. Upon appeal, the Court of Appeal confirmed the order of Mr. Justice Buckley, but limited the injunction to noise and vibration caused by gas-engines. The plaintiff afterwards applied to Mr. Justice Buckley for a writ of sequestration on the ground that the defendants had deliberately and wilfully disobeyed the order of the Court, and, as before stated, his lordship granted the application and the Court of Appeal confirmed his order, but directed that the writ should lie in the office for one week in order to give the defendants an opportunity to apply to Mr. Justice Buckley for any indulgence they might think themselves entitled to

Mr. Henry Terrell, K.C. (with him Mr. Dibdin, K.C.), on behalf of the defendants, said that since the order of the Court of Appeal on May 8, a special meeting of the Council had been held at which all members were present with the exception of four, and a resolution was unanimously passed that the clerk should be instructed to make this application for the purpose of telling the Court that the Council were not aware until the motion for sequestration was made that there had been any breach of the order or undertaking; that it was their intention strictly to obey the order, and their desire to apologise to the Court for their disobedience. Those resolutions were proved by an affidavit of Mr. Atkins, the chairman. He (counsel) now asked that the writ of sequestration be discharged upon the defendants undertaking not to use gas engines except in the case of emergency.

Mr. Astbury, K.C. (with him Mr. A. à Beckett Terrell), for the plaintiff, left the matter in the hands of the Court.

Mr. Justice Buckley said there could be no doubt that there had been by the defendants a very grave breach of the order of the Court. The order he should make would be one restraining the defendants from working gas engines at all. He imposed the term of the defendants submitting to an injunction, so that in case the order was disobeyed there would be some responsible person who could be sent to prison. He would suspend the issue of the writ of sequestration till June 17 to enable the defendants to take professional advice and be able to tell his Lordship what they proposed to do to enable them then to provide for their requirements without nuisance. If he was then

satisfied with their proposals he should be prepared to grant a further extension of time. The motion would accordingly stand over till Monday, June 17.

Order accordingly.

AN ARCHITECT'S ACTION FOR FEES.

THE case of West *v.* Barclay came on on the 14th inst. before Mr. Justice Kennedy, sitting without a jury, in the King's Bench Division. This was an action by the plaintiff, an architect, practising in Maddon-street, to recover from the defendant 295*l.*, the balance of fees he alleged to be due to him.

The material facts were as follows:—The defendant employed the plaintiff to carry out certain improvements at Gaddesby Hall, in Leicestershire, at a cost of 14,349*l.*, and the question in dispute was whether the plaintiff was to be limited to the ordinary 5 per cent. upon the total usually charged, or whether he was entitled to an extra 5 per cent. The plaintiff alleged that he was entitled, by reason of an agreement which he had entered into with the defendant to keep and pass the accounts, and to act as builder and contractor as well as architect, to an extra 5 per cent., making 10 per cent. in all. The defendant, while admitting that there was such an agreement, alleged that 5 per cent. was all that the plaintiff was entitled to.

His Lordship having heard evidence came to the conclusion that the plaintiff's claim for 10 per cent. was clearly untenable, but thought that he was entitled to something beyond the 5 per cent scale, inasmuch as he had done more than an architect would have done under that scale. He accordingly held that the plaintiff was entitled to remuneration at the rate of 7½ per cent. on the total amount after certain items had been deducted; and in the result, on the state of accounts between the parties, gave judgment for the defendant with costs.

Mr. Reginald Brown, K.C., and Mr. Spencer Bower appeared as couusel for plaint'ff; and Mr. Reginald Bray, K.C., and Mr. H. D. Bonsey for the defendant.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

770.—A GAS REGULATOR: *R. Hein and T. Hahn.*—The gas flows around a valve to a floating bell which is dipped into mercury, and passes thence through pipes to the outlet. As the bell rises the valve—to the stem of which it is fixed—closes upon its seat, the overlying packing will adjust itself to the upper fixed seating of the valve in the face of which a groove is cut for that purpose, and the exit tube is provided with a regulating screw.

782.—APPARATUS FOR VENTILATORS: *W. B. Johnson.*—In an opening of the wall is fitted a frame which carries a set of curved louvres that will act as baffle-plates, the middle one being extended and pivoted at its sides so that it may serve to regulate the extent of the inlet opening, and also to separate the incoming from the outgoing currents of air.

791.—MANUFACTURE OF ARTIFICIAL STONE: *H. Schürholz.*—After the lime has been wetted in baskets it is spread over a layer of damp sand from the pit in a mixing-cylinder, and is covered with another layer of sand, superfluous moisture in both components being absorbed by the slaking of the lime; water is subsequently added to the resultant dry powder, and the blocks are then moulded and hardened.

800.—A HOLDFAST FOR PIPES: *J. Hague.*—The holdfast is devised for fastening socketed rainwater or waste pipes against the walls of buildings Elongated and inclined slots are cut in two flat wings or lugs, which are combined with the pipe-socket.

819.—TILES FOR WALLS AND ROOFS: *W. F. Jones.*—The tiles, fashioned in the shape of a lozenge, have their lower ribs on the inside and their upper ribs on the outside, with rebated sides for interlocking purposes, together with inside ribs or ridges and nail-holes for the hanging ribs. The flowing of water beyond the joints and its suction by capillary attraction are prevented by means of grooves made in the side ribs.

848.—CHIMNEY COWLS AND TOPS: *J. Linkleter.*—The inventor has devised a spiral band which, when it is mounted so as to rotate upon a vertical spindle, is provided with additional blades that it may be turned by the wind.

885.—A CONTRIVANCE FOR USE IN DRY DOCKS, AND SIMILAR PURPOSES: *R. Lewis.*—A bilge-block, which rests on the vertically-moving portion of a screw-jack, is pivoted to the framing; the lower platform is set to turn about an axle in such a manner that pressure upon the bilge-block will tend to cause the platform to turn in a direction opposite to that of the hands of a clock, the amount of pressure being indicated to the workman at the hand-wheels of the screw which lifts or lowers the movable part of the screw-jack by means of the attachment to a spring balance of the one end of a wire, whereof the other end is fastened to the platform. The position of the screw is shown with an indicator, and—in a variant shape—one hand-wheel may serve to move two bilge-blocks.

891.—LATHING OF "EXPANDED METAL": *R. G. Sykes.*—Lathing intended for fireproof buildings is made of rolled sheets of which the V-channels or strips are bent in opposite directions; in another shape the joining-strips are twisted, and in that case all the channels are made so as to be opened outwards.

896.—A CLUTCH FOR LIFTING AND SIMILAR GEAR: *J. T. F. Conti.*—For an automatical disengagement of the clutch at a predetermined time, and (in the case of control by the governor of a Meyer expansion gear) for rendering the number of revolutions of the valve spindle a function of the extent of movement of the governor, the ascent or descent of the governor moves lengthwise a screwed socket, for each position of which will be established a corresponding position of the expansion slides of the engine; then as the spindle continues to revolve it will, by means of the socket, liberate a projection which has been engaged by the governor with a pinion. That same object will also be attained by substituting for the socket a screwed ring that encompasses a muff around the spindle, and will be moved lengthwise by the governor.

916.—AN APPLIANCE FOR WINDOWS: *E. Kiebbé.*—For opening or closing a window or hinged frame the cord is fastened to a curved pierced stay-rod pivoted on to the window, and is then passed over a pulley mounted upon a lever at the end of which is a catch which (upon release of the cord) a spring draws into engagement with the stay-rod, which a pull of the free end of the cord will again liberate. The movement of the lever is limited in extent by means of a stop formed upon the flanged bracket that carries the lever and has a fixed support.

936.—FITTINGS OF BASINS FOR LAVATORIES: *W. D. Mould.*—A bracket for lavatory basins and similar purposes consists of a front bar and two separated sides, each of which is indented at intervals in order that any length may be broken off. The sides will slide through slotted projections upon angle-irons of the corner-joints, and can be then fastened with set-screws. For brackets that have no front bars the sides consist of two parts, whereof one slides over the other.

940.—REGULATOR-VALVES FOR FLUSHING MECHANISM: *J. Shanks.*—In this invention, which is adapted also for use with ships' closets, the valve is attached to the lower end of a weighted cylinder that has a slot in which slides a rod; on the end of the rod is a block through which the lever of the discharge-valve is inserted. As soon as the discharge-valve has been operated the block will impinge against the top of the cylinder and so deliver the flush as it lifts the cylinder and the valve, but the cylinder will, through gravity, sink so as to shut the valve as soon as the handle has been released. In some cases the valve may be fastened to a block which will work within a cylinder as the handle is being operated, a relieving valve being fitted in the block.

953.—FOLDING GATES: *J. Bode.*—Vertical bars pivoted to top and bottom links constitute a folding gate, which is mounted upon a post from which are projections on to which the bars are pivoted. The outer ends of bars pivoted to the top and bottom of the post are bent and provided with rollers that will engage at opposite sides in slots cut in the remotest vertical bar. They are also linked together so that when the handle is moved to operate a lever the two bars will move to either open out or fold up the gate; a catch retains the lever in either position. Loops from the lever, that engage alternately with the bars, have projections that cause the lever to draw some of the bars inwards and to force the other bars outwards at the folding of the gate.

961.—TOOLS FOR ROAD-MAKING AND TRENCHING MACHINES: *H. Morrison.*—Bars and levers forming a parallel motion carry the square spindle upon which the tool is mounted. Since the spindle is rigid as regards the bar, the tool will remain always parallel with itself as it is lifted and depressed by the worm and sector. For removal of broken earth the tool-holder is fitted with a digger or scoop.

969.—ROOFING TILES: *H. Wilken.*—In order that the outer surface of the roof when tiled shall present no projections, the tiles are fashioned with tongued and grooved edges that will interlock, and with bevelled lower edges that will fit into corresponding angular recesses in the tiles next below, whilst the lower ends of the side ribs of the tiles next above fit into recesses in the middle of the angular portions, the tiles being laid so as to break joint.

1,054.—SIPHONICAL DISCHARGE: *S. Clark.*—The lifting of a valve allows the discharge to enter the longer leg of the siphon, thus starting the action. The valve-rod is joined to a pivoted lever upon the free end of which is a disc that forms the top of bellows placed in communication with a ball. When the ball is squeezed the valve is lifted for starting the flush, as the lever is thereby forced upwards.

1,063.—FLUSHING APPARATUS: *R. Pauls.*—To the float is attached the sliding piston of the stand-pipe, through openings in which, as well as through an annular groove in the piston, the supply-pipe will discharge. The supply becomes cut off with the rising of the float, and when the latter is lifted still higher with the pull the flush will escape through holes in the stand-pipe as they are left uncovered by the piston.

1,118.—MANUFACTURE OF BRICKS: *T. Whittaker.*—The upper of the two plungers is mounted upon a cross piece which is vertically reciprocated with cranks upon the shaft, whilst cams upon the shaft reciprocate a cross head which carries the lower plunger. The surplus clay is squeezed back again into the mill as the lower plunger rises after the upper plunger has been depressed into the mould and clay is filled into the mould. The pug-mill becomes automatically arrested when the lower plunger is lifted above the opening in the mould, the plungers then press the brick between them and ascend to raise it out of the mould. A cross head moves a pusher, which transfers the brick to the second mould or elsewhere, as may be required, and the pug-mill is again started with the action downwards of the lower plunger. The machine to which the improvement relates is specified in No. 7,456 of 1893.

1,141.—MEANS OF AFFIXING PLASTIC MATERIALS TO WOODWORK: *S. Elliott.*—For securing plaster, cement, asphalt, and similar plastic materials the inventor has devised flattened discs composed of cement, earthenware, &c., having undercut or bevelled edges which are to be affixed to the woodwork with inclined nails, and over which the plastic coating can then be laid. The discs are described as being available instead of laths in the construction of fireproof ceilings, walls, floors, roofs, and so on.

1,148.—CONDUITS FOR ELECTRICAL CONDUCTORS: *Siemens Bros. & Co., A. E. Foster, and H. J. Nott.*—The troughs or conduits have their lids thickened in the middle so as to form fitting shoulders, and they have also portions that project within them which will afford a raised support for the conductor as well as provide a spigot-joint.

1,200.—A BRACKET FOR SHELVING: *B. Smith.*—A wedge having inclined teeth is tongued and grooved on to the wedge to which the angle-iron support is fastened; the support has a slot that takes the pin of the former wedge; in the end of the bookcase is a groove which receives the two wedges that become jammed through the weight upon the shelf. The bracket can be freed for its adjustment by a lifting of the toothed wedge.

MEETINGS.

FRIDAY, MAY 17.

Society of Arts (*Howard Lectures*).—Mr. Alfred C. Eborall on "Polyphase Electric Working." IV. 8 p.m.

Architectural Association Discussion Section.—Mr. P. E. Newton on "A Tour in Mid-France." 7 p.m.

SATURDAY, MAY 18.

Architectural Association.—Last Spring Visit, to Chesterfield House, Mayfair (Lord Burton's). 2.30 p.m.

Association of Municipal and County Engineers.—Oswestry meeting.

Royal Institution.—Professor W. M. Flinders Petrie on "The Rise of Civilisation in Egypt." II. 3 p.m.

Edinburgh Architectural Association.—Visit to Pitfirrane House and Pittencrieff House and Glen.

MONDAY, MAY 20.

Royal Institute of British Architects.—Professor W. M. Flinders Petrie, D.C.L., on "The Sources and Growth of Architecture in Egypt," illustrated by lantern slides. 8 p.m.

Institution of Junior Engineers.—Visit to the works of the Renewable Electric Lamp Company, Brunswick-place, City-road, N. 6 p.m.

TUESDAY, MAY 21.

Society of Arts (*Applied Art Section*).—Professor W. M. Flinders Petrie, D.C.L., on "The Rise and Development of Egyptian Art." 8 p.m.

WEDNESDAY, MAY 22.

Institution of Electrical Engineers (*Birmingham Local Section*).—Discussion on Mr. A. C. Eborall's paper, "Some Notes of Polyphase Substation Machinery." 7.30 p.m.

THURSDAY, MAY 23.

Carpenters' Hall, London Wall (*Lectures on Carpentry and Joinery*).—Mr. E. J. Burr on "Timber Houses." 7.30 p.m.

Institution of Electrical Engineers (*Dublin Section*).—Annual general meeting. Mr. W. Tatlow on "The Arrangement of Accumulators in a Small Installation." 7.30 p.m.

SATURDAY, MAY 25.

Royal Institution.—Professor W. M. Flinders Petrie on "The Rise of Civilisation in Egypt." III. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 2.—By BAXTER, PAYNE, & LEPPER (at Bromley).

Bromley, Kent.—Newman-rd., Fairlight, f., r. 63*l.*	£1,070
4 to 18 (even) Weston-grove, u.t. 60½ yrs. g.r. 32*l.*	1,230

May 3.—By HUSSEY & SON (at Exeter).

Woodbury, Devon.—Three closes of land, 4 a. 3 r. 27 p., f.	395
Helena Villa and 1 r. 15 p., f.	510
Four freehold cottages	2,570
Exton Farm, 78 a. 0 r. 28 p., f.	2,850
Upper Nutwell House and 36 a. 1 r. 12 p., f.	360
Upton Pyne, Devon.—Five freehold cottages	

By DAVID BURNETT & CO. (at Exeter).

Exmouth, Devon.—Marpool-rd., Ryll-court and 10 a. 0 r. 31 p., f.	6,000

May 6.—By BLAKE & CARPENTER.

Croydon.—Waddon-rd., Wadden House and 15 a. 2 r. 15 p., f.	21,000

By G. BRINSLEY & SON.

Enfield.—Park-ter., f.g.r. 52*l.* 10s., reversion in 86 yrs.	2,320

Bromley-by-Bow.—Whitethorn-st., f.g.r. 7*l.*, reversion in 48 yrs. £180
Dalston.—32 and 36, Angrave-st., f. 555

By WM. HOUGHTON.

City of London.—51, Moorgate-st., beneficial lease for 15 yrs., r. 400*l.* 700
Walthamstow.—164 and 166 Wood-st., c. 340
Pearl-rd., two blocks of building land, f. 1,020
Forest-rd., three blocks of building-land, f. 2,030

By TOMLIN & Co.

Anerley.—17 and 19, Derwent-rd., u.t. 64 yrs., g.r. 20*l.*, r. 60*l.* 435

By G. A. WILKINSON & SON.

Surbiton, Surrey.—Brighton-rd., a freehold building estate, 6 a. 2 r. 11 p. 7,100
Winchester-rd., a plot of land, f. 180
Arlington-rd., two corner plots of building land, f. 645

By J. C. PLATT (at Long Sutton).

Long Sutton, Lincs.—Wisbech-rd., Seagate House and Homestead, area 26 a., f. and c., r. 90*l.* .. 1,450

By J. H. BETHELL (at Forest Gate).

Forest Gate.—34 to 62, 70 to 76 (even), Studley rd., f. (in lots) 6,060

May 7.—By BROAD & WILTSHIRE.

Beckenham, Kent.—Avenue-rd., four plots of building land, f. 230

By HAMPTON & SONS.

Covent-garden.—23 and 24, Henrietta-st., area 2,240 ft., u.t. 59 yrs., g.r. 80*l.* 7,500
Hutton, Essex.—Tomlyns and 6 acres, f. 2,025

By G. HEAD & Co.

Shepherd's Bush.—114, St. Stephen's-avenue, f., r. 32*l.* 585
Marylebone.—147, Marylebone-rd., and 2, Circus-mews, f., r. 70*l.* 1,550
Sutton, Surrey.—5 and 6, St. Nicholas-rd., f., r. 52*l.* 10s. 710

By MOORE, SMALLMAN, & Co.

Kensington.—3, Bolingbroke-rd., u.t. 78 yrs., g.r. 12*l.*, r. 55*l.* 630

By FAYERMAN & Co. (at Kidderminster).

Kidderminster, Worcester.—Chester-rd., Greenhill and 17 a. 1 r. 24 p., f. 2,125
Chester-rd., enclosure of land, 6 a. 2 r. 29 p., f. 500

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

Battersea.—Culvert-rd., The Haberdashers' Arms p.-h., u.t. 45 yrs., r. 140*l.* 3,750
Knightsbridge.—Raphael-st., The Pakenham p.-h., u.t. 36 yrs., r. 200*l.* 13,000

By RICHARD SMITH & Co. (at Masons' Hall Tavern).

Mayfair.—South Audley-st., The Audley p.-h., u.t. 23¾ yrs., r. 200*l.* 20,250

May 8.—By ALDRIDGE & LEVER.

Maidenhead, Berks.—The Drive, Summerlea, and 2 a., f. 5,400

By H. DONALDSON & SON.

Bermondsey.—215, 217, and 219, St. James's-rd., u.t. 30 yrs., g.r. 9*l.* 12s. 780
233 and 235, Fort-rd., u.t. 34 yrs., g.r. 8*l.* 510
Southgate.—Chaseside, Springfield, f. 880
Orchid-rd., freehold nursery ground, r. 45*l.* 780
Islington.—252, Essex-rd., u.t. 16½ yrs., g.r. 10*l.*, r. 36*l.* 190
83 to 97 (odd), Church-rd., u.t. 37 yrs., g.r. 40*l.*, r. 375*l.* 3,500
152, Downham-rd., u.t 50 yrs., g.r. 6*l.* 6s., r. 46*l.* 455
Wood Green.—1, Wendover-villas, f., r. 28*l.* 450

by GARRETT, WHITE, & POLAND.

Oxford-st.—3 and 4, Soho-st., area 1,650 ft., f., r. 195*l.* 5,500
Peckham.—39 and 39A, Clayton-rd., f. 670
Woodford.—1 to 5, Joshua-cot., c. 325

By J. HIBBARD & SONS.

Hackney.—15 and 16, London-fields, f. 705

By FRANK JOLLY & Co.

Bow.—2, Bow-rd., f., e.r. 45*l.* 700
Hackney.—116, 118 and 120, King Edward-rd., u.t. 38 yrs., g.r. 20*l.* 12s., r. 130*l.* 1,225

By VICTOR VAUGHAN.

Sittingbourne, Kent.—Canterbury-rd., the Shakespeare Hotel, f., r. 140*l.* 4,100
Plaxtol, Kent.—High-st., The Hollies and 4 acres, f. 1,010
Hoxton.—2, 3 and 4, Reeves-pl., f. 630
14 to 19, Reeves-pl., f. 1,125
Stoke Newington.—16 to 21, Brown's-pl., u.t. 12¾ yrs., g.r. 9*l.* 230

By DOUGLAS YOUNG & Co.

Acton.—2 to 14 (even), Woodhurst-rd., u.t. 95 yrs., g.r. 55*l.*, r. 359*l.* 18s. 3,010
44, Woodhurst-rd., u.t. 95 yrs., g.r. 10*l.*, r. 40*l.* .. 420
Kensington.—130, 138, and 148, Addison-gardens, u.t. 93 yrs., g.r. 25*l.* 10s., r. 145*l.* 1,495
Balham.—44 and 46, Rowfant-rd., u.t. 93 yrs., g.r. 13*l.*, r. 70*l.* 690
Romford, Essex.—Marlborough-rd., five plots of land, f. 170
Norwood.—27, Palace-sq., f., r. 35*l.* 300

By RENDELL & SYMONS (at Newton Abbot).

Clapton.—104, Reighton-rd., u.t. 80 yrs., g.r. 6*l.*, e.r. 30*l.* 345
Doddiscombsleigh, Devon.—Lower and Higher Roads Fields, 13a. 3r. 5p., f. 200

By F. PITTIS & SON (at Chale).

Chale, Isle of Wight.—North End Farm, 3a. 0r. 15p., f. 320
Lower House Meadow, with cottage, &c., 1 a., f. 305
Five freehold enclosures, 7 a. 2 r. 9 p. 730
Two freehold enclosures, 2 a. 0 r. 15 p. 180

May 9.—By H. J. BLISS & SONS.

Shoreditch.—181, Shoreditch High-st., f., r. 105*l.* 179, Shoreditch High-st., and 19, Anning-st., f., r. 130*l.* 4,350
Mile End.—150, Globe-rd., r. 29*l.*; also i.g.r.'s 32*l.*, u.t. 13 yrs., g.r. 21*l.* 4,000
Croydon.—267 to 285 (odd), Whitehorse-rd., f. .. 250
Norwood.—1 and 3, Seymour-pl., f. 1,790

By HOLCOMBE, BETTS, & WEST.

St. Luke's.—175, Whitecross-st., f., r. 70*l.* 450
Southwark.—Gravel-lane, c.g.r. 20*l.*, reversion in 72 yrs. 1,660
5, Price's-st., c., r. 20*l.* 500
Blackfriars.—72, Upper Ground-st., f. and c., r. 125*l.* 420
Upper Ground-st., c.g.r. 15*l.*, reversion in 22 yrs. 2,250
Holloway.—Burnard-pl., the Beehive Tavern, f.g.r. 21*l.*, reversion in 44 yrs. 590
Burnard-pl., f.g.r. 5*l.* 5s., reversion in 21 yrs. .. 640
Burnard-pl., f.g.r. 6*l.* 10s.. reversion in 44 yrs.. 150
Lee.—195, High-rd., f., r. 35*l.* £170
High-rd., &c., f.g.r. 24*l.*, reversion in 26 yrs. .. 930
High-rd., f.g.r. 16*l.*, reversion in 26 yrs. 870
High-rd., &c., f.g.r. 11*l.*, reversion in 25 yrs. .. 730
Church-st., f.g.r.'s 92*l.* 11s., reversions in 24 to 27 yrs. 1,005
Bexley Heath, Kent.—179 and 181, The Broadway, f., e.r. 56*l.* 3,520
Kingston, Surrey.—28, 30, and 32, Thames-st., f., r. 135*l.* 710

By C. C. & T. MOORE.

Poplar.—East India-rd., f.g.r. 10*l.* 10s., reversion in 21 yrs. 3,170
Old Ford.—Parnell-rd., f.g.r. 18*l.*, reversion in 54 yrs. 795
Stoke Newington.—99, Manor-rd., u.t. 74 yrs., g.r. 8*l.* 8s., e.r. 55*l.* 490
32 to 62 (even), Johnson-st., u.t. 3½ yrs., g.r. 48*l.* 630
Hoxton.—78 and 80, Hoxton-st., f., r. 240*l.* 550
Stepney.—12 to 15, Brunswick-pl., u.t. 50 yrs., g.r. 15*l.* 4,250
Limehouse.—37, Clemence-st., u.t. 60 yrs., g.r. 4*l.*, e.r. 40*l.* 300

By NEWBON, EDWARDS, & SHEPHARD.

Kentish Town.—78, Southampton-rd., u.t. 47½ yrs., g.r. 10*l.* 350
Barnsbury.—126, Hemingford-rd., u.t. 41 yrs., g.r. 2*l.*, r. 52*l.* 245
Canonbury.—29, Pyrland-rd., u.t. 49 yrs., g.r. 6*l.* 6s., r. 45*l.* 610
Holloway.—14, St. Peter's-rd., u.t. 44½ yrs., g.r. 8*l.* 8s., r. 42*l.* 420
2, Fairmead-rd., area 7,000 ft., f. 380
Hackney.—81, Victoria Park-rd., u.t. 33 yrs., g.r. 8*l.*, e.r. 60*l.* 1,225

By STIMSON & SONS.

Newington.—83, Union-rd., u.t. 42 yrs., g.r. 8*l.* 5s., r. 50*l.* 540
31, 32, and 33, Union-rd., u.t. 42 yrs., g.r. 22*l.* 10s., r. 90*l.* 310
Union-sq., &c., i.g.r. 11*l.*, u.t. 42 yrs., g.r. nil. 675
Old Ford.—10 and 12, Stour-rd., f., r., 68*l.* 135
5 to 19 (odd), Bream-st., f. 600
Camberwell.—149, New Church-rd., f. 2,350
Peckham.—62, Furley-st., u.t. 55½ yrs., g.r. 7*l.* 10s., r. 35*l.* 320
Dulwich.—180, 182, and 184, Crystal Palace-rd., u.t. 65 yrs., g.r. 19*l.* 10s. 280
Peckham.—54, Bushey Hill-rd., f., e.r. 45*l.* 810
Stratford.—27, 32, 43, 45, and 47, Cullum-st., u.t. 75¼ yrs., g.r. 25*l.* 15s. 610
West Ham.—121 to 127 (odd), Pelly-rd., u.t. 30 yrs., g.r. 44*l.* 680

By J. A. & W. THARP.

Leytonstone.—68, Hainault-rd., f., e.r. 30*l.* 315
Stratford.—194 to 200 (even), Crownfield-rd., u.t. 78 yrs., g.r. 18*l.* 310
845

By FULLER, MOON, & FULLER (at Croydon).

Croydon.—40, Keen's-rd., f. 750
103 to 163, 173 to 179 (odd), Bynes-rd., f. 6,780
133, London-rd., f., e.r. 65*l.* 1,015

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s d.	
Hard Stocks	1 14 6	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 11 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 8 0	" " "
Flettons	1 9 0	" at railway depot.
Red Wire Cuts	1 15 6	" " "
Best Fareham Red	3 11 0	" " "
Best Red pressed Ruabon Facing.	5 5 0	" " "
Best Blue Pressed Staffordshire	4 4 6	" "
Do., Bullnose	4 9 0	" " "
Best Stourbridge Fire Bricks	4 2 6	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
plays, Chamfered, Squints	14 0 0	" " "
Seconds Quality White and Dipped Salt Glazed	2 0 0	" less than best
	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "

PRICES CURRENT (*Continued*).

BRICKS, &c.

	s. d.	
Best Portland Cement	36 6	per ton, delivered.
Best Ground Blue Lias Lime	25 6	" "

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 13s 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.
Bath "	1 7	" "
Farleigh Down Bath	1 8	" "
Beer in blocks	1 6½	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks	2 1½	" "
Red Corsehill	2 5	" "
Red Mansfield "	2 4½	" "
Hard York in blocks	2 10	" "
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt
" " 6 in. Rubbed Ditto	3 0	" "
" " 3 in. sawn both sides slabs (random sizes)	1 3	" "
" " 3 in. self-faced Ditto	0 9½	" "

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at rly. dep.
best seconds "	10 15 0	" "
16×8 best "	6 2 6	" "
20×10 best blue Portmadoc	10 18 0	" "
16×8 best blue Portmadoc	6 0 0	" "
20×10 best Eureka unfading green	11 2 6	" "
16×8 " "	6 15 0	" "
20×10 Permanent green	10 0 0	" "
16×8 " "	5 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000 at rly. depôt.
Hip and valley tiles	3 7	per doz. " "
Best Broseley tiles	48 6	per 1,000 " "
Hip and valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. ornamental Do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 9	" " "
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	16 10 0	18 0 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	12 0 0	13 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 10 0	11 0 0
2 in. by 4½ in. and 2 in. by 5 in.	9 0 0	10 10 0
Foreign Sawn Boards—		
1 in. by 1¼ in. by 1½ in.	10 0	more than battens.
in.	1 0 0	more than battens.

	At per load of 50 ft.	
Fir timber: Best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	3 10 0	4 0 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	27 10 0	28 10 0
3 in. by 9 in.	24 0 0	25 0 0
Battens, 2½ in. and 3 in. by 7 in.	20 0 0	21 0 0
Second yellow deals, 3 in. by 11 in.	22 10 0	24 0 0
" " 3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	16 10 0	18 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
Do. 3 in. by 9 in.	22 0 0	23 0 0
Battens	16 10 0	17 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	14 0 0	14 10 0
Third yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	14 10 0
Battens	12 10 0	13 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 10 0	16 10 0
" " " 3 in. by 9 in.	14 10 0	15 10 0
Battens	12 10 0	13 10 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
" " " 3 in. by 9 in.	13 0 0	14 0 0
" " battens	11 0 0	12 0 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6

[*See also page 501.*]

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Municipal Buildings	Hereford Corporation	100*l.*, 75*l.* and 50*l.*	June 30

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., supplied by	Tenders to be delivered
Gasworks Extension	Mountain Ash (Glam.) U.D.C.	J. Williams, Town Hall, Mountain Ash	May 21
Street Works, Bassett-street, &c., Abercynon	do.	H. P. Linton, Town Hall, Mountain Ash	do.
Sewerage Works, Foleshill	Coventry Corporation	J. E. Swindlehurst, Civil Engineer, St. Mary's Hall, Coventry	do.
Pipes, Junctions, Bends, &c.	do.	do.	do.
Flint Road Metal, near Maidenhead	Cookham R.D.C.	F. Laurens, Civil Engineer, 23, St. Luke's-close, Maidenhead	do.
Shed, Clatterbridge, Cheshire	Wirral Guardians	C. O. Francis, Architect, 5, Richmond-street, Liverpool	do.
Goods Shed and Stage, Bullfield, Bolton	L. & Y. Railway Company	R. C. Irwin, Hunt's Bank, Manchester	do.
Houses, Dean-street, Stockbridge	Edinburgh Corporation	T. Hunter, City Chambers, Edinburgh	do.
Farmhouse, Rostowrack Farm, St. Dennis		G. Gow, Tregothnan Office, Truro	do.
Farmhouse, Longburgh, near Carlisle	Mr. M. Hodgson	J. Leslie, Architect, 71, Broad-street, Carlisle	do.
Cemetery Enclosure Works, near Stonehaven, N.B.	Fetteresso Parish Council	G. Gregory, jun., Architect, Stonehaven	do.
Concrete Reservoir, &c., Strichen	Deeside District Committee	Jenkins & Marr, Civil Engineers, 16, Bridge-street, Aberdeen	do.
Laundry Buildings	Belfast Guardians	Young & Mackenzie, Engineers, Scottish Prov. Bldgs., Belfast	do.
Waterworks, Cast-iron Pipes, &c., near Rotherham	Swinton U.D.C.	R. Fowler, Engineer, Council Offices, Swinton	May 22
Cast-iron Water Mains & Laying, Winnington, Cheshire		John Moreton, Moss Farm, Northwich	do.
Villa, Tintagel, Cornwall		Captain J. Brown, Tintagel	do.
Cottages and Offices	Balrothery (Ireland) R.D.C.	A. Scott, Civil Engineer, 16, William-street, Drogheda	do.
Farmstead, &c., Carribees, near Consett	Mr. Jas. Oliver	G. T. Wilson, Architect, 121, Durham-road, Blackhill	do.
Granite Road Metal, Hayward's Heath	Cuckfield U.D.C.	T. Simmonds, Surveyor, Cuckfield	May 23
Business Premises, Fore-street, Redruth	Mr. W. G. Wilton	S. Hill, Architect, Green-lane, Redruth	do.
Pair of Houses, Hipperholme, Yorks.		L. Coates, Architect, Waterhouse-street, Halifax	do.
Additions to Schools	Lindfield (Sussex) School Board	Kirk & Sons, Architects, Huddersfield	do.
Vestry, St. Augustine's Church, Scissett, Yorks.		R. Walker, Architect, Windermere	do.
Additions to British School, Sedbergh, Yorks		Thos. Hibbert, Surveyor, Council Offices, Cirencester	do.
Borehole, &c.	Cirencester U.D.C	E. Jones, Architect, Porth	May 24
Seven Houses, Trealaw, Rhondda, Glam.		E. W. Dyson, Civil Engineer, Horwich	do.
Two Schools and House, Hazlehead, &c., nr. Sheffield	Thurlstone School Board	J. H. Bradford, Surveyor, Town Hall, Aylesbury	do.
Public Convenience, near Town Hall	Aylesbury U.D.C.	J. Y. McIntosh, Architect, Cornwallis-street, Barrow	do.
Three Shops, Vickerstown, Walney	Barrow Co-op. Society, Limited	W. H. Ralston, Streatham Castle, Darlington	do.
Farm Buildings, Cutthorns Farm, near Burnopfield		Kirk & Sons, Architects, Dewsbury	do.
Parsonage, Dewsbury Moor		W. G. Scott & Co., Architects, Workington	do.
Three Houses, Harrington, Cumberland	Mr. J. McNeil	S. Coates, Frenchgate, Richmond, Yorks.	do.
House, Dundas-street, Richmond		E. F. Jones, Llangollen	do.
Sheds, &c., Smithfield	Llangollen U.D.C.	do.	do.
Fire Station	do.	Sands & Walker, Engineers, Angel-row, Nottingham	do.
Water Supply Works	Wivenhoe (Essex) U.D.C.	E. F. Hooper, Architect, 6, Union-road, Exeter	May 25
Two Cottages, Cocktree Estate, Northtawton		C. F. Horsfall & Son, Architects, Lord-street Chambers, Halifax	do.
Five Houses, West Vale, Halifax	Lexden & Winstree R.D.C.	J. Eunals, Surveyor, Copford, near Colchester	do.
Road Metal	Wallsall Corporation	J. R. Cooper, Borough Offices, Walsall	do.
Surveyor's Materials		J. W. Jones, Architect, Gwily House, Llandilo	do.
Chapel, Llanlluan, Llandebie		W. Buck, Architect, Horsham	do.
Warehouse and Stores, East Parade, Horsham		Rev. P. Cantwell, Parochial House, Killucan, co. Westmeath	do.
Restoration Works at Parish Church, Killucan, Ireland		T. Bradley, Council Offices, St. Annes-on-Sea	do.
Fire Station, House, &c.	St. Annes-on-Sea U.D.C.	A. C. Bothams, Civil Engineer, Municipal Offices, Salisbury	do.
Chimney Shaft	Salisbury U.S.A.	do.	do.
Refuse Destructor Buildings	do.	J. S. Moffat, Architect, 53, Church-street, Whitehaven	do.
Twenty-nine Houses, Siddick, Cumberland	St. Helens Colliery Co., Ltd.	F. W. Lacey, Engineer, Municipal Offices, Bournemouth	do.
Bridge, West Cliff	Bournemouth Town Council	W. W. Snailum, Architect, Trowbridge	May 27
Additions to Workhouse Infirmary, Senington	Trowbridge, &c., Guardians	W. R. Herring, Engineer, Gasworks, New-street, Edinburgh	do.
Cast-iron Main Pipes, &c., Granton	Edinburgh Gas Commissioners	J. Preston, Surveyor, Woodlands, Uttoxeter	do.
Footbridges, near Abbots Bromley, Staffs.	Uttoxeter R.D.C.	See Advertisement	May 28
*Water Pipes, &c.	Epsom R.D.C.	Engineer, Public Offices, Dyne-road, Kilburn, N.W.	do.
*Road Making and Paving Works	Willesden District Council	W. G. Champion, Surveyor, Council Offices, Northam	do.
Concrete Wall, near Appledore, Bideford	Northam U.D.C	W. C. Morgan, 10, Edwards-terrace, Bedlinog	do.
Twenty-five Houses, Bedlinog, Wales		See Advertisement	May 29
*Broken Granite	Thame U.D.C.	Hope & Maxwell, Architects, Trinity-buildings, Newcastle	do.
Workshops, Glasshouse Bridge, Newcastle	Tyne Steam Shipping Co., Ltd	F. W. Vanstone, Engineer, Paignton	do.
Water Supply Works, New Moorland	Paignton (Devon) U.D.C	J. C. Rees, Architect, Neath	May 30
Schools, Skewen	Coedfranc School Board	J. J. Green, Architect, 19, South John-street, Liverpool	do.
Church, Trimdon-street, Sunderland		Kincaid & Co., Engineers, 29, Great George-street, S.W.	do.
Electricity Station	Kingstown (Ireland) U.D.C.	School Board Offices, Park-road, West Hartlepool	May 31
*School Buildings	West Hartlepool School Board	J. Ladds, Architect, 7, Doughty-street, W.C.	June 1
*Mortuary	Bromley Guardians	W. H. Hope, Hampton Wick	June 3
*Boilers (2)	Kingston Guardians	do.	do.
*Boiler House	do.	Borough Surveyor, Town Hall, Spa-road, S.E.	do.
*York Flags, Granite, &c.	Bermondsey Borough Council	M. H. Medland, Architect, 15, Clarence-street, Gloucester	do.
Schools, Linden-road	Gloucester School Board	Bailey Denton, Son, & Lawford, 9, Bridge-street, Westminster	do.
*Sewers	Billericay R.D.C.	R. J. Beale, Architect, 3, The Broadway, Westminster	June 4
*Kursaal	Harrogate Corporation	F. Bunting, Surveyor, Fair Meadow, Maidstone	do.
Guernsey Granite, &c.	Maidstone U.D.C.	A. E. Mullins, Architect, 16, Church-street, Camberwell, S.E.	June 5
*Relief Station	Camberwell Guardians	Baldwin Latham, Parliament Mansions, Victoria-street, S.W.	do.
*Conduits, Drains, &c	Melton Mowbray U.D.C.	W. J. Cudworth, Engineer, York	do.
Coal Depôts, &c., Park-street, Hull	N. E. Railway Company	J. Mansergh, Engineer, 5, Victoria-street, Westminster	June 10
*Water Tower, &c.	Rochford R.D.C.	F. S. Antliff, Architect, Draycott	June 12
*Hospital	Shardlow Hospital Committee	H. Wright, Surveyor, 23, Princes-street, Ipswich	No date
New Road, Westerfield-road Estate, Ipswich		A. H. Walker, Civil Engineer, Town Offices, Loughborough	do.
Broken Granite, &c.	Loughborough (Leics.) Corporation	H. W. Booth, Architect, Hopwood-lane, Halifax	do.
Schools, Copley	Halifax School Board	R. Horsfall & Son, Architects, 22A, Commercial-street, Halifax	do.
Five Houses, Rothwell-road, Halifax		Mr. Gunner, Knaphill, Woking	do.
Three Pairs of Villas, Knaphill, Woking		Openshaw & Gill, Architects, 6, Fleet-street, Bury	do.
Pair Semi-detached Houses, Arnold-pk., Manchester	Mr. R. Lowenhaupt	H. H. Dunstall, Architect, 9, New-road-avenue, Chatham	do.
Laundry Buildings, Boster's-hill, Chatham		Town Clerk, Town Hall, Dumbarton	do.
Building Work, Parish Church, Dumbarton		E. Dodd, 37A, Waterloo-street, Birmingham	do.
New Roads, Sewers, &c., Birmingham		Mr. Wilkinson, 3, Church-street, Padiham, Lancs	do.
Drainage Works, &c., Cemetery, Padiham		F. Armett, Architect, 178, Ellesmere-road, Sheffield	do.
Three Houses, Grimesthorpe-road, Sheffield		Garside & Pennington, Architects, Pontefract	do.
Lodge, &c., Welburn Hall, Kirbymoorside	Lambeth Hayles Charity Trustees	See Advertisement	do.
*Artizan Dwellings			

[See also next page.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant Building Inspector	Bournemouth Town Council	104*l.* per annum	May 20
*Junior Civil Engineering Assistant	Shanghai Municipal Council	240*l.* per annum	May 25
*Assistant	Kensington Borough Council	150*l.* per annum	May 29
*Junior Assistant	do.	30*l.* per annum	do.
*Building Inspector	Coventry Corporation	130*l.* per annum	May 30
*Inspector of Nuisances, Surveyor & Water Bailiff	Ledbury U.D.C.	75*l.* per annum	June 3
*Assistants (2)	Hendon R.D.C.	2*l.* each per week	June 5

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, pp. xix. & xxii.*

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 2 3	0 3 0

Prepared Flooring—	Per square.	
1 in. by 6 in. and 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 6 in. and 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 6 in. and 7 in. yellow, planed and matched	0 16 0	1 1 0
1 in. by 6 in. and 7 in. white, planed and shot	0 11 0	0 13 0
1 in. by 6 in. and 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 6 in. and 7 in. white, planed and matched	0 14 0	0 16 6

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 15 0	8 15 0
Compound Girders ,, ,,	9 10 0	10 15 0
Angles, Tees and Channels, ordinary sections	9 7 6	11 7 6
Flitch Plates	9 15 0	10 10 0
Cast Iron Columns and Stanchions, including ordinary patterns	8 5 0	10 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	8 10 0	9 0 0
Staffordshire Crown Bars, good merchant quality	9 0 0	9 10 0
Staffordshire "Marked Bars"	11 10 0	- - -
Mild Steel Bars	9 0 0	10 0 0
Hoop Iron, basis price	9 10 0	10 0 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 5 0	- - -
,, ,, to 24 g.	11 10 0	- - -
,, ,, to 26 g.	12 15 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 10 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 10 0	- - -
,, ,, 26 g.	14 10 0	- - -
Cut nails, 3 in. to 6 in.	10 10 0	- - -
(Under 3 in. usual trade extras.)		
LEAD—Sheet, English, 3 lbs. & up.	15 10 0	- - -
Pipe in coils	16 0 0	- - -
Soil Pipe	18 10 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 0 0	- - -
Silesian	23 10 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0½	- - -
Thin ,,	0 1 2	- - -
Copper nails ,,	0 1 2	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 4	- - -
SOLDER—Plumbers' ,,	0 0 7	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

	per ft. delivered.
15 oz. thirds	3d.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¾d. ,, ,,
,, ,, fourths	5d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, ,, fourths	6d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, ,, fourths	3½d. ,, ,,
Fluted sheet, 15 oz.	4½d. ,, ,,
,, ,, 21 ,,	3d. ,, ,,
½ Hartley's Rolled Plate	3½d. ,, ,,
⅝ ,, ,, ,,	4d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 6
,, ,, ,, in barrels	,,	0 2 7
,, ,, ,, in drums	,,	0 2 9
Boiled ,, ,, in pipes	,,	0 2 8
,, ,, ,, in barrels	,,	0 2 9
,, ,, ,, in drums	,,	0 2 11
Turpentine, in barrels	,,	0 2 6
,, in drums	,,	0 2 8
Genuine Ground English White Lead	per ton	24 10 0
Red Lead, Dry	,,	24 10 0
Best Linseed Oil Putty	per cwt.	0 9 0
Stockholm Tar	per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 15 0
Berlin Black	0 10 0
Knotting	0 10 0
Best French and Brush Polish	

TO CORRESPONDENTS.

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDEEN.—For the execution of works at Kingseat Asylum. Mr. Mackenzie, architect, 343, Union-street, Aberdeen:—

Masonry.—Edgar Gauld, Gilcomstone-terrace, Aberdeen £26,983 11 6
Carpentry.—Henry & Keith, Gilcomstone Park, Aberdeen 16,526 0 0

BLAENCLYDACH (Rhondda).—For the erection of proposed new hotel, to be called Park Hotel, at Blaenclydach, Rhondda, Glam., for Mr. John Phillips. Messrs. Griffiths & Jones, architects and surveyors, Tonypandy, and Glynrhondda-street, Cardiff:—

Dan Davies, contractor, Treherbert* £4,475

BRIDLINGTON.—For additions, &c., to Nos. 4 and 5, Prospect-street, for Mr. E. C. Dixon. Mr. J. Earnshaw, architect, Carlton House, Bridlington:—

C. Limon	£1,114 0 0	A. Gardam	£962 0 0
E. Corner	1,052 0 0	W. Barnes	959 0 0
G. Day	1,013 0 0	E. E. Yeomans	943 0 0
F. Flintoft	984 10 0	T. Atkin	919 0 0
E. Wilson	977 5 9	Sampson & Siddall*	912 10 0
T. Spink	966 10 0		
Barr & Booth	964 0 0		

[All of Bridlington.]

CASTLEFORD.—For the erection of school buildings, Pontefract-road, for the Primitive Methodist Trustees, Castleford, Yorkshire. Mr. R. M. McDowall, architect, Carlton-street, Castleford. Quantities by the architect:—

Excavating, Draining, and Concreting.
J. L. Rodger, Albion-street, Castleford* .. £69 3 0
Bricklaying and Masonry.
T. Thompson, Smawthorn-gve., Castleford* 397 0 0
Carpentry and Joinery.
R. Gillatt, Perseverance-street, Castleford* 185 0 0
Slating.
S. Evison, Pontefract-road, Castleford* .. 43 10 0
Plumbing and Glazing.
Wilson & Son, Eastfield Works, Castleford* 133 14 6
Plastering.
Jas. Lockwood, Wilson-street, Castleford* 27 0 0
Painting.
W. Lawrence, Ambler-street, Castleford* .. 16 8 0
Total £871 15 6
[Architect's estimate, £850.]

CLEVEDON (Somerset).—For the construction of a new road at Clevedon. Mr. T. J. Moss-Flower, A.M.Inst.C.E., 28, Baldwin-street, Bristol:—

J. Woolford	£482 4 6	T. Hill	£350 0 0
W. A. Green	457 0 0	J. Coles, Walton, Clevedon*	292 8 0
Rowell & Sons	422 5 0		
E. Monks	413 0 0		

EASTBOURNE.—For the erection of fifteen transformer chambers, for the Corporation. Mr. J. K. Brydges, C.E., Electricity Works, Eastbourne:—

Six Large Chambers.
Cast-iron.
John Every, Lewes £519 6 6
(Accepted + £35 for erecting on foundations provided by Corporation.)
Beck & Co., London 611 8 0
Brick.
Kemp & Sons, Hove 1,380 0 0
Tapner & Co., Hastings 1,266 0 0
Nine Small Chambers.
Cast-iron.
John Every, Lewes 133 10
Brick.
Tapner & Co., Hastings 121 0 0
(Neither accepted. To be constructed by Corporation. C.I. pavement frames and covers for these from John Every for £26 15s. 9d. accepted.)

ELLAND (Yorks).—For the erection of public baths, South House estate, for the Urban District Council. Mr. G. Hepworth, architect, 20, Bradford-road, Brighouse. Quantities by the architect:—

Masonry.—J. & R. A. Crawshaw, Ripponden* £2,070 0
Carpentry and Joinery. — Crowther Bros., Elland* 838 18
Concreting.—Greenwood & Sons, Halifax* 486 5
Plastering. — Hutchinson & Sons, Elland* 46 16
Structural Steelwork. — Hitchin & Son, Halifax* 285 0
Slating.—James Smithies, Brighouse* 95 10
Painting.—Hutchinson & Son, Elland* 68 0
Heating and Engineering.—Fawley & Son, Halifax* 524 0
Plumbing and Glazing.—Fred Ogden, Brighouse* 295 0
£4,709 9

FARNWORTH (Lancs).—For the erection of Reform Club buildings, Peel-street. Mr. J. H. Taylor, architect, 15, Grove-street, Kearsley, Farnworth. Quantities by architect:—

J. Royley	£2,123	W. Myatt	£2,045
W. Cocker	2,100	J. B. & J. Entwisle, Kearsley*	2,035
Coope Brothers	2,057		

See also next page.

GREAT GRIMSBY.—For the erection of school[s] Harold-street, New Clee, for the School Board. Mr. H. C. Scaping, architect, Court-chambers, Grimsby. Quantities by Mr. J. Watson, Hull :—

Pattinson & Sons ..	£22,845	Gilbert & Kirton ..	£18,650
F. Beilby	20,300	Thompson & Sons, Grimsby*	18,200
Alex. Sime	19,984		
Hewins & Goodhand	19,854		

KIRKCALDY (N.B.).—For the erection of new police buildings, court-room, &c. Messrs. Williamson & Inglis, architects, Kirkcaldy. Quantities by Mr. Geo. Morham, Edinburgh :—

Masonry.—T. & Y. Menzies, Kirkcaldy*	£12,188	0	0
Smith's Work.—J. Mundy, Glasgow*	1,400	0	0
Joinery.—M. Wishart, Kirkcaldy*	3,398	0	0
Plumbing.—Knox & Sons, Edinburgh*	1,091	0	0
Slating.—Currie & Cant, Kirkcaldy ..	337	16	0
Plastering.—W. Grant, Kirkcaldy* ..	788	0	0
Glazing.—Dickson & Walker, Edinburgh*	168	2	8
Painting.—John Carruth, Glasgow* ..	262	11	6
	£19,633	10	2

LONDON.—For restoring damage caused by fire at No. 12, Crane-court, Fleet-street, E.C., for Messrs. James Sears & Sons. Mr. Alfred E. Nightingale, architect, Albert Embankment, S.E. :—

Lidstone & Son....	£581	0	
Marsland & Son ..	575	0	
W. J. Young	£398	0	
Barber & Son*	394	10	

LONDON.—For extension of offices, for the Star Life Assurance Society, 32, Moorgate-street. Mr. Arthur Blomfield Jackson, architect, 26, Mecklenburgh-square, W.C. :—

Holland & Hannen ..	£12,350	0	0
Colls & Sons	11,984	0	0
E. Edwards .	11,923	0	0
Holloway Bros.	10,728	0	0
Patman & Fotheringham*	£10,693	6	10

LONDON.—For Marlesford Lodge classrooms, &c., at the Branch School, Hammersmith, for the Managers of the Kensington and Chelsea School District. Mr. Cecil A. Sharp, architect, Old Queen-street, Queen Anne's-gate, S.W. Quantities by Messrs. J. & A. E. Bull, 35, Craven-street, Charing-cross :—

Smith & Sons	£3,891	Veale & Carter	£3,403
R. A. Jewell.....	3,795	T. Sharpington	3,399
Martin, Wells, & Co.	3,699	Wilson Bros. & Lamplough	3,379
J. Christie.....	3,597	Huntley Bros.	3,345
F. J. Chinchen.....	3,543	Foster Bros., Norwood Junction* ..	3,338
W. Hammond.....	3,535		
Barker & Co.	3,475		

LONDON.—For restoring damage caused by fire to ironing-room at Caprera Lodge, 35, Jew's-row, Wandsworth, for Mr. H. P. Bartle. Mr. Alfred E. Nightingale, architect, Albert Embankment, S.E. :—

Turtle & Appleton	£194	0	
Lewis	173	15	
Casse*	£173	10	
Mansell	162	0	

LONDON.—For the erection of a warehouse and dwelling at Grinstead-road, Deptford, S.E., for Messrs. F. Braby & Co., Ltd. Mr. John Jas. Downes, architect, 199, Lewisham High-road, S.E. :—

Jerrard & Son	£800	Thos. D. Leng.....	£620

NORWICH.—For the erection of fences, wall, railing, &c., St. Andrew's Churchyard. Mr. A. E. Collins, C.E., Guildhall, Norwich. Quantities by engineer.

T. H. Gill, Norwich £239
(Recommended for acceptance.)

RUGBY.—For the erection of a new mission church. Mr. E. H. Lingen Barker, architect, Hereford :—

Foster & Dicksee..	£913	0	
J. Hollowell	884	0	
Hopkins & Son....	862	0	
McCarthey & Co.	844	0	
Sturgess & Son ..	£821	0	
Linnell & Son, Rugby*	796	12	

SMETHWICK.—For the erection of new Church of St. Stephen, to accommodate 550 adults, for the Rev. Jas. Whiteley. Mr. Fred T. Beck, architect, Walfrun-chambers, Darlington-street, Wolverhampton. Quantities by Mr. H. Vale, Wolverhampton :—

Collins & Godfrey ..	£6,148	Dallow	£5,950
Moffatt	6,100	Wistance	5,900
Whitehouse	6,075	Reynolds	5,850
Smith & Sons	6,050	Harley & Sons, Smethwick‡	5,502
H. Lovatt.....	6,020	J. Mallin	5,390
Sapcote	5,998		
Willcock & Co.	5,990		

‡ Accepted after reduction in competition with Mr. Mallin.

TONYPANDY (Glam.).—For the erection of two shops, Dunraven-street, Tonypandy, for Mr. John Jones, boot-maker. Messrs. Griffiths & Jones, architects, Tonypandy and Cardiff :—

Morgan & Williams, Tonypandy, contractors* £1,007

WOLVERHAMPTON.—For the erection of schoo buildings, St. Peter's-square, for 850 children, for the Managers. Mr. F. T. Beck, architect, Wulfrun-chambers, Darlington-street, Wolverhampton. Quantities by Mr. H. Vale :—

J. Bilson	£7,952	0	0
H. Lovatt	7,918	0	0
H. Gough	7,603	0	0
Thos. Skett ..	7,442	5	5
Jas. Herbert..	7,335	0	0
F. L. Jones ..	7,225	0	0
Harley & Sons	£7,164	0	0
Cave & Sons	7,126	0	0
Willcock&Co., Wolverhampton*	7,076	0	0

(Accepted after revision).

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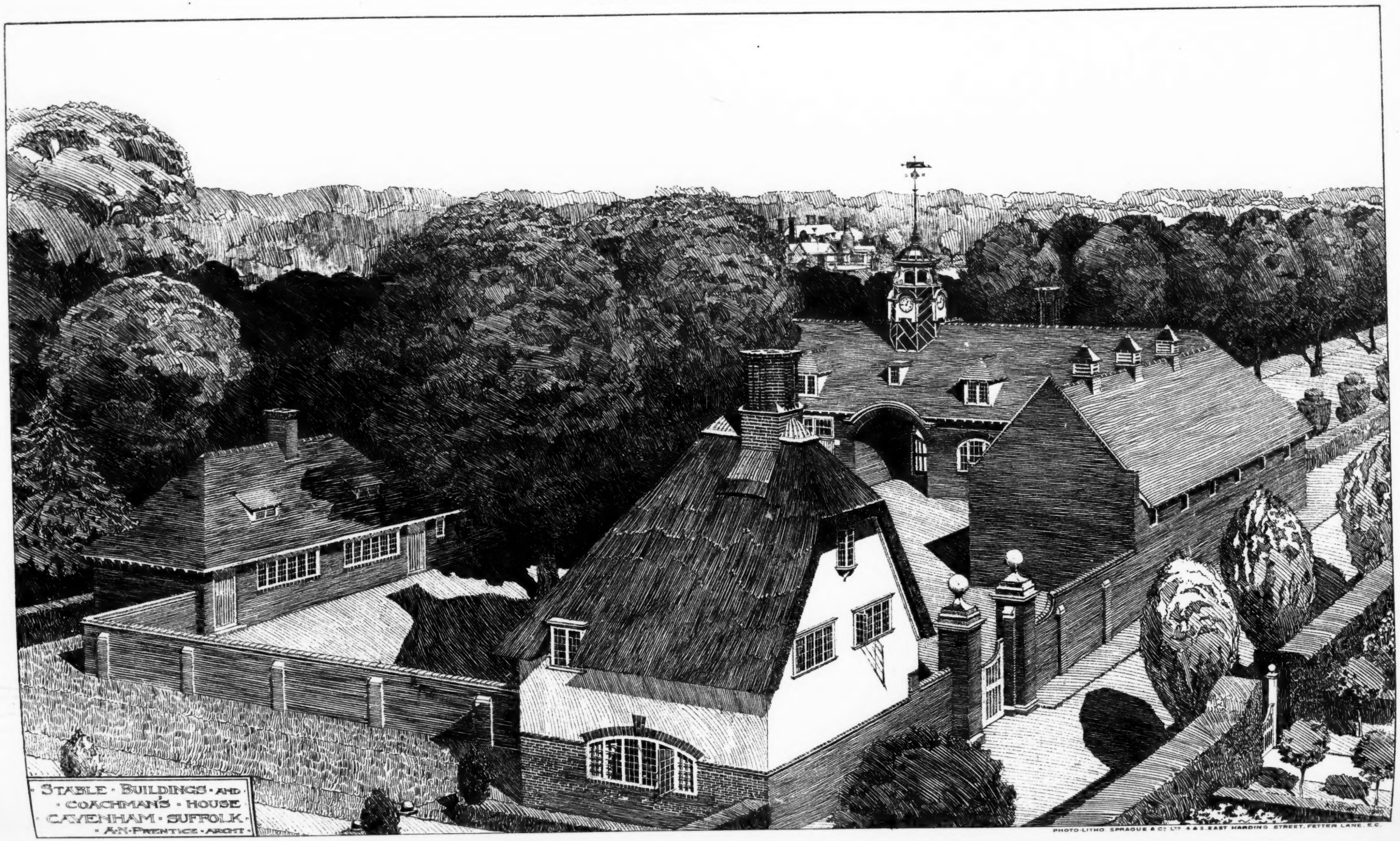

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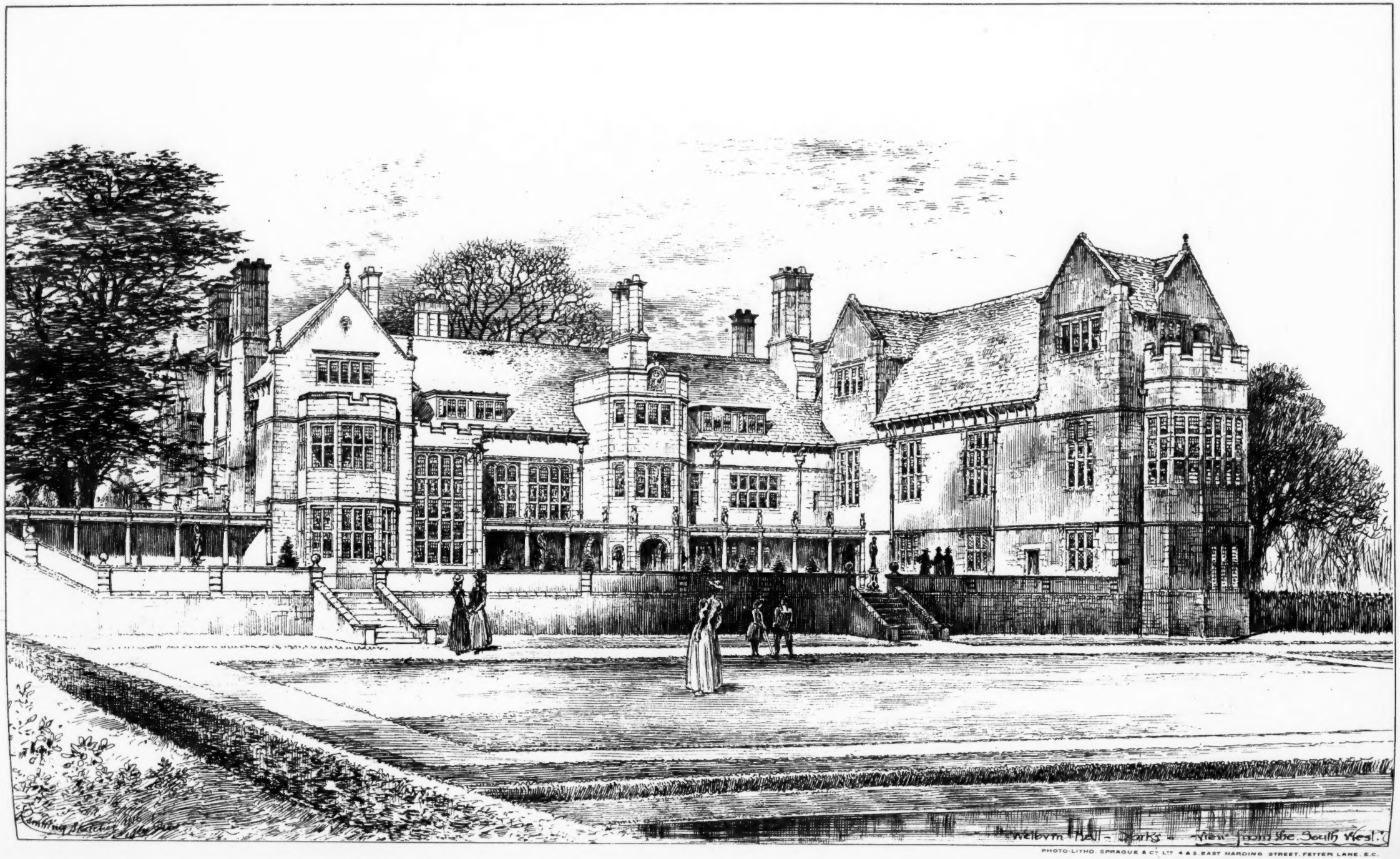

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WELBURN HALL, YORKSHIRE: VIEW FROM SOUTH-WEST.—Mr. W. H. Brierley, Architect

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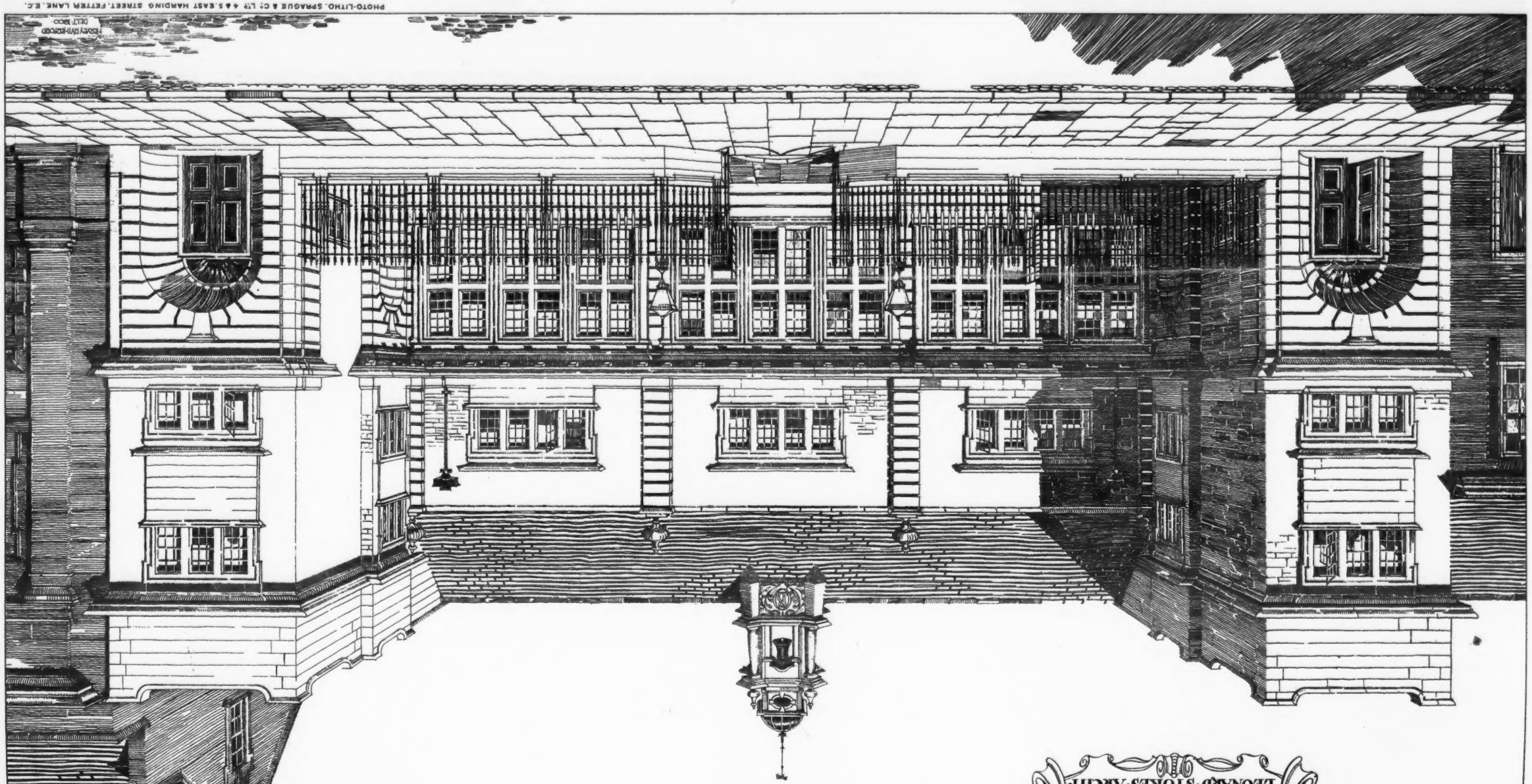

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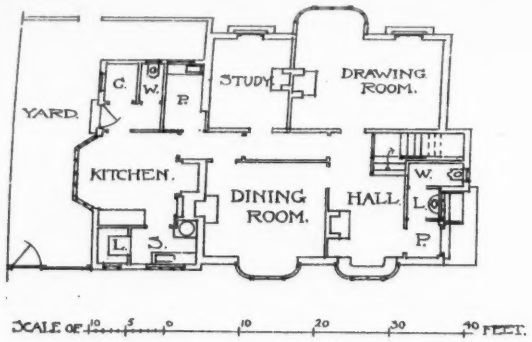

· GROUND·FLOOR·PLAN.

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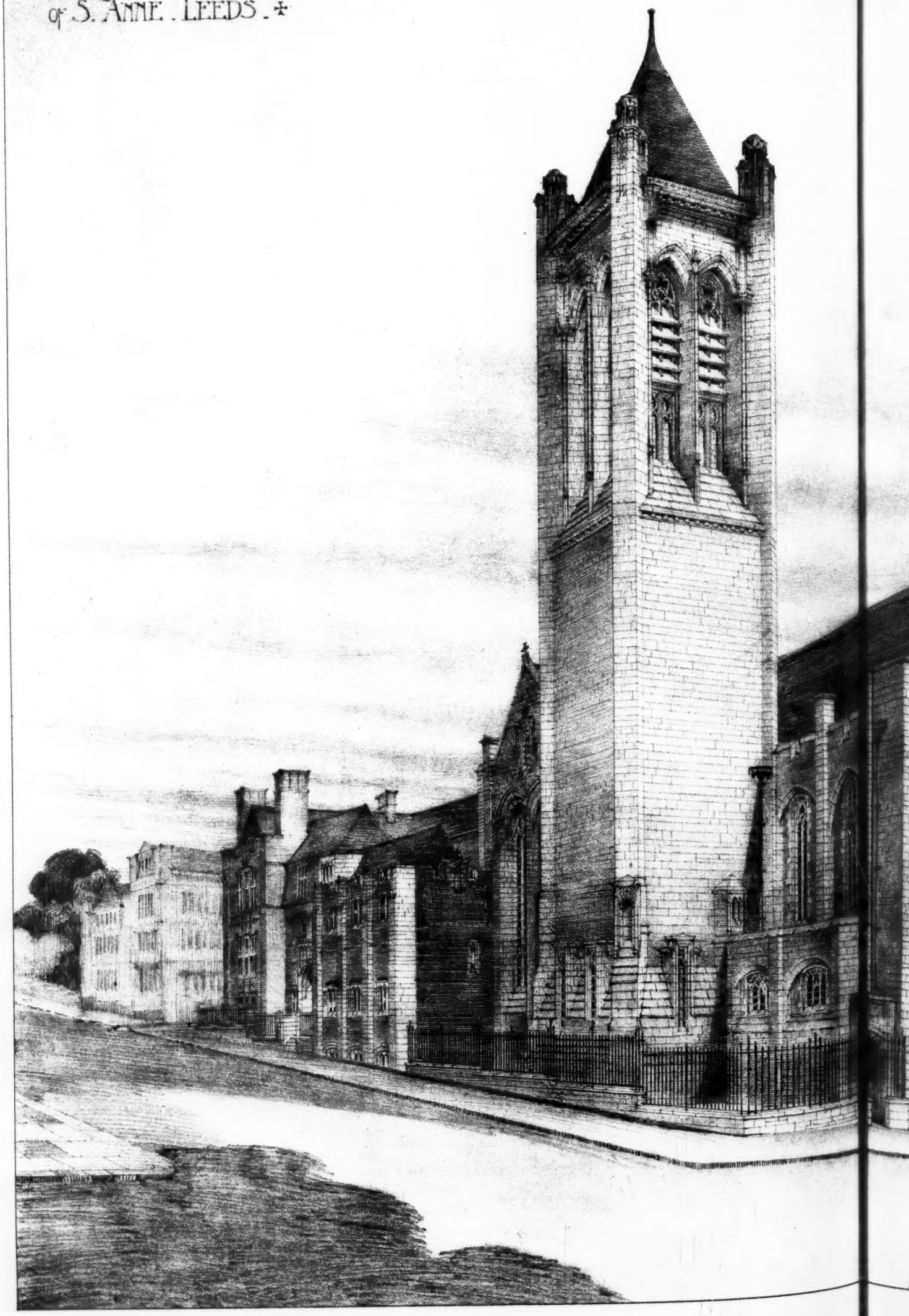
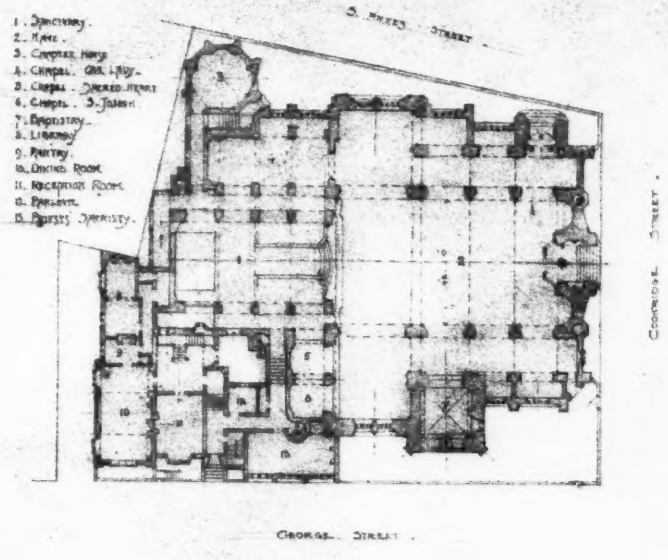
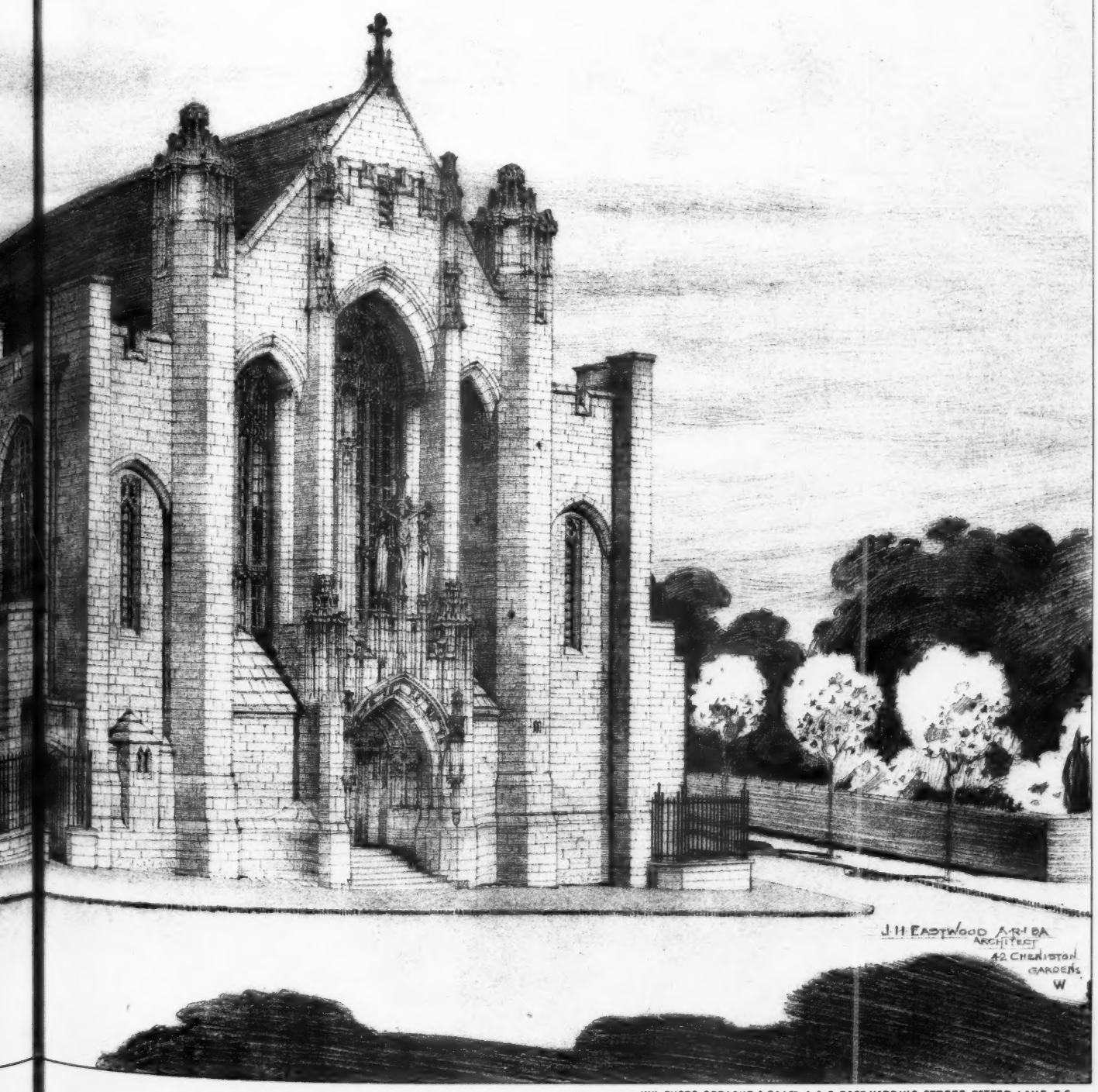
Proposed Cathedral of S. Anne, Leeds. ✠







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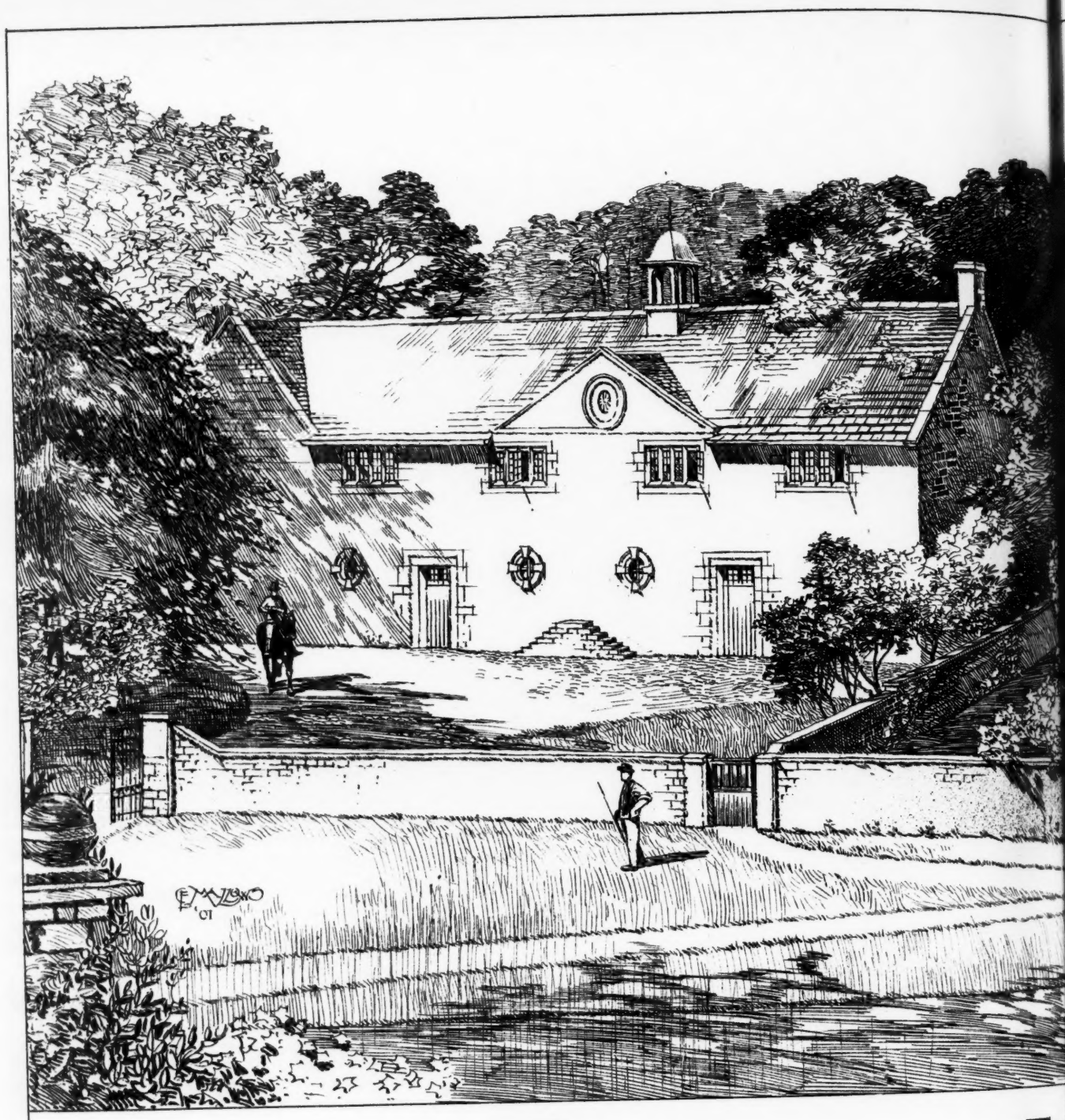
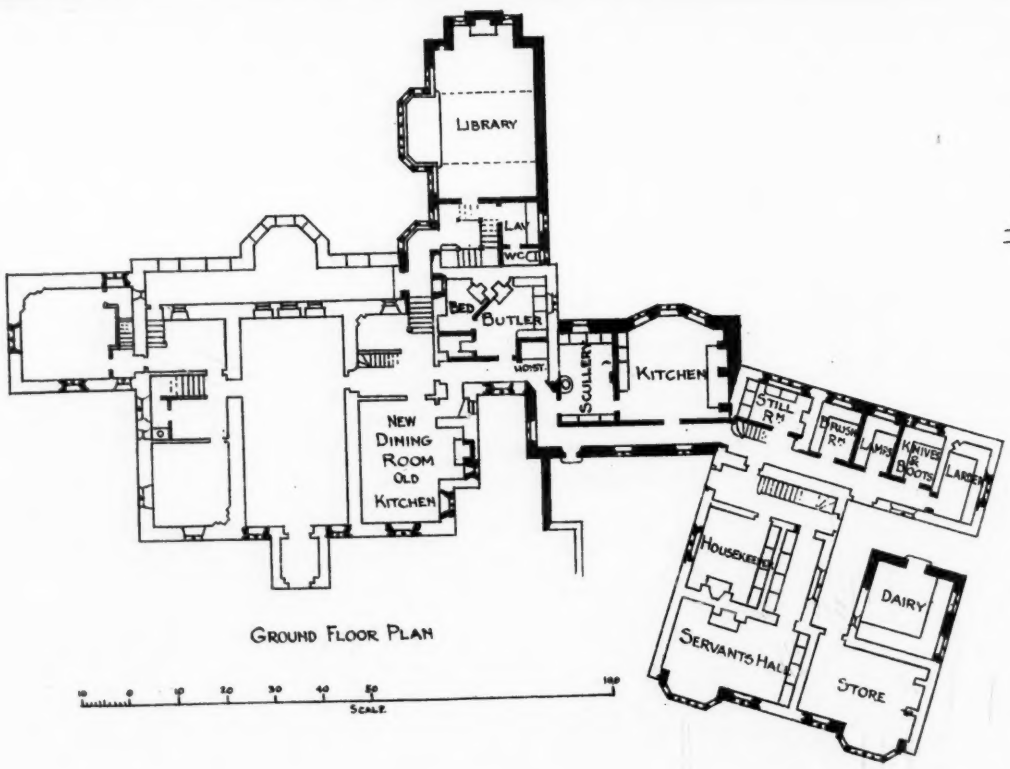
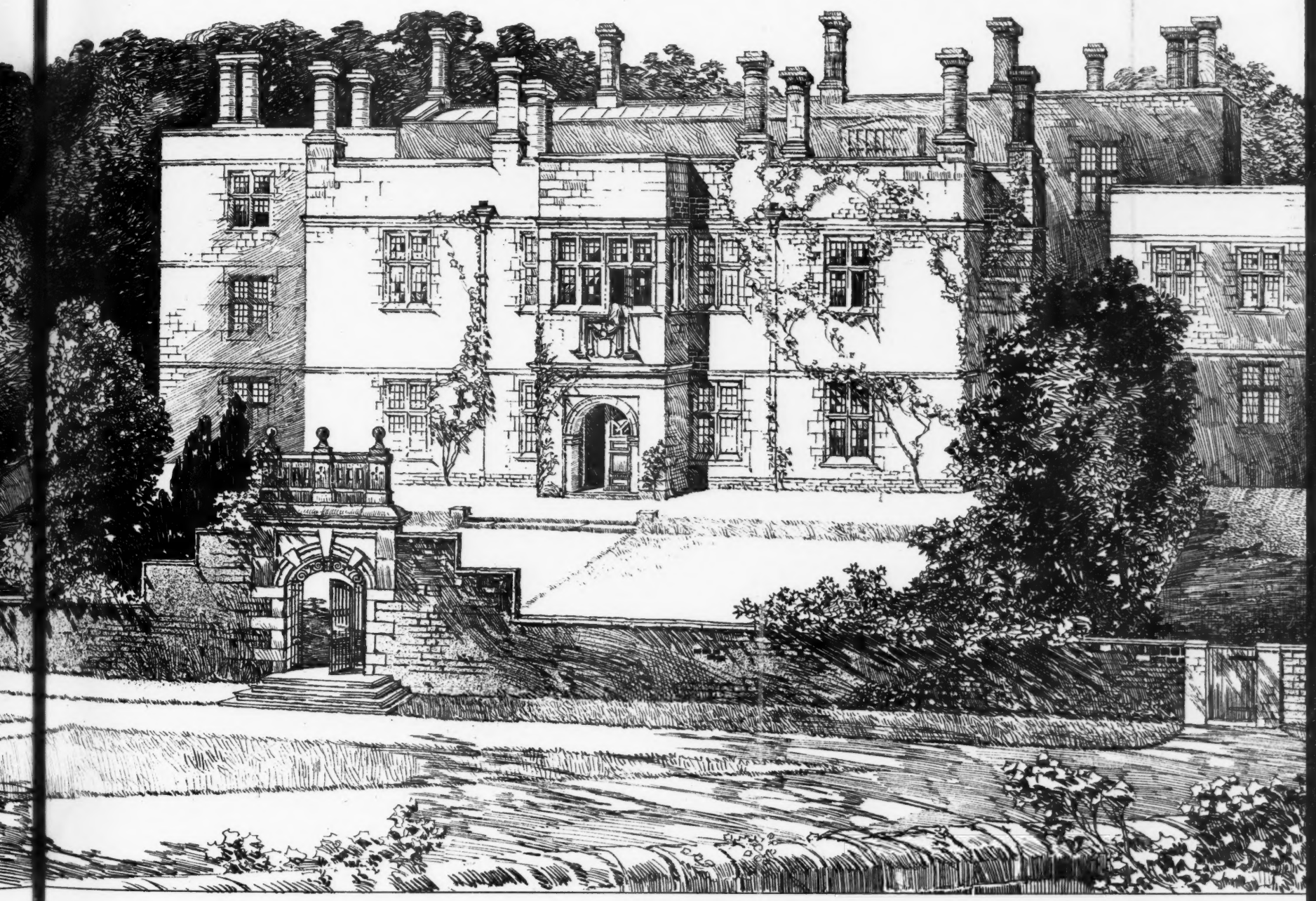
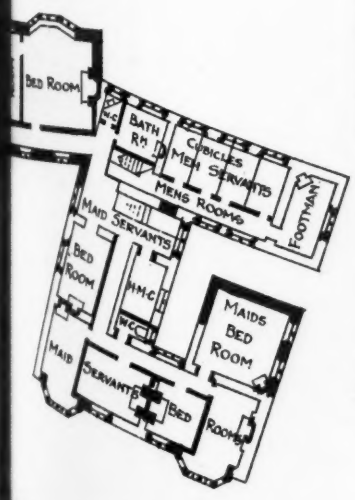




GROUND FLOOR PLAN

FIRST FLOOR PLAN





: ADDITIONS AND ALTERATIONS :

AT

: TISSINGTON HALL :

: DERBYSHIRE :

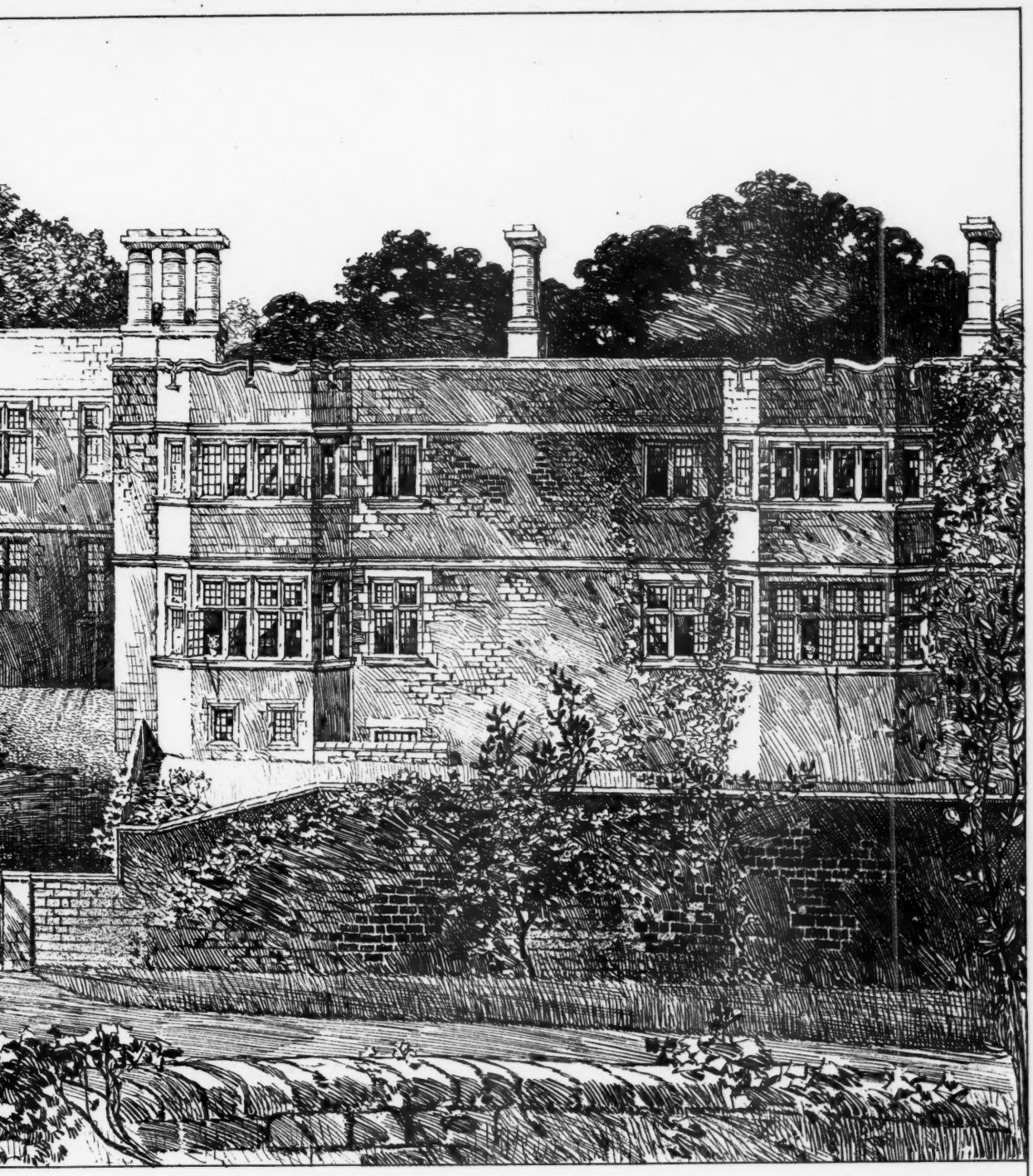
: FOR SIR RICHARD FITZ HERBERT BART :

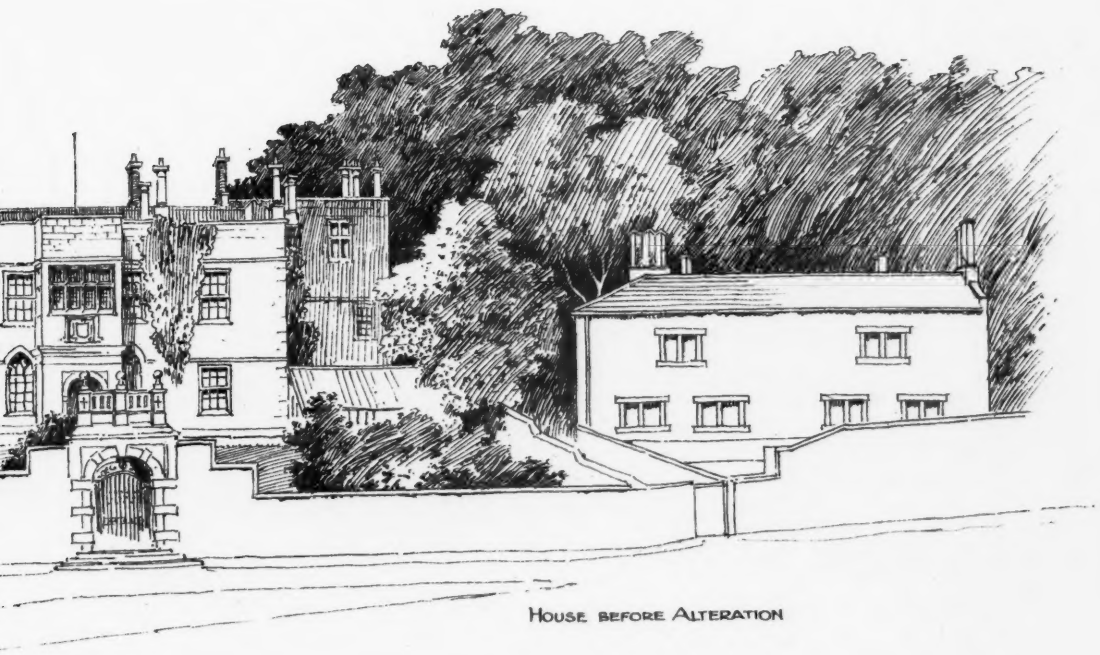
: ARNOLD MITCHELL :
: ARCHITECT :

ATION:

:

BERT BART:





HOUSE BEFORE ALTERATION

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